

# Annual Report

2017-2018



**bmtpc**

Building Materials and Technology Promotion Council  
Ministry of Housing & Urban Affairs  
Government of India



# Annual Report 2017-2018



**Building Materials & Technology Promotion Council**  
Ministry of Housing & Urban Affairs, Government of India  
Core-5A, First Floor, India Habitat Centre, Lodhi Road  
New Delhi – 110003



---

## FOREWORD

It is my honour and pride to present the Twenty-eighth Annual Report of my organization i.e. the Building Materials & Technology Promotion Council for the year 2017-2018, an autonomous organization under the Ministry of Housing & Urban Affairs, Govt. of India.

BMTPC is in its 28<sup>th</sup> year of service to nation with a commitment to promote sustainable building materials and construction systems. In this journey of promotion of innovative systems other than conventional brick & mortar/RCC framed construction, BMTPC had to work really hard with rejuvenated efforts several times so as to bring paradigm shift in use of innovations in the construction sector. Also, with the launch of PMAY(U) in June 2015, the quest to bring innovative construction systems around the globe which can not only fast track delivery of quality sustainable houses but also comply with structural, functional and safety norms stipulated in Indian Standards gained importance. Further, in order to accomplish the ardent task of providing houses to each household by 75<sup>th</sup> year of independence under PMAY(U), the best construction practices which are time tested and proven elsewhere need to be identified, studied, evaluated & certified so that they can be straight-way transplanted to suit Indian geo-climatic conditions. BMTPC being mandated to promote good construction practices, seized the opportunity and identified, evaluated and certified emerging construction systems for mass housing. There has been good response from public and private agencies and State Governments e.g. Andhra Pradesh, Chhattisgarh, Gujarat, Kerala, Maharashtra, Telangana, Odisha, Jharkhand and Tamil Nadu. They have started incorporating these new systems in their construction projects. Some of Central Govt. Deptts. such as MES, Ministry of Defence, CRPF, BSF, Police Housing Corporation, CPWD, NBCC, HPL, IITs have also started using emerging technologies.

One of the important components of technology transfer is demonstration construction using alternative materials and technologies. As a new initiative, BMTPC is constructing Demonstration Housing Projects in different parts of India using emerging technologies with the objective of spreading awareness about new technologies and disseminate technical know-how in the States under the Pradhan Mantri Awas Yojana (Urban) – Housing for All Mission. The construction work of Demonstration Housing Project at Nellore, Andhra Pradesh and Bhubaneswar, Odisha have been completed. The work for construction of demonstration houses at Biharshariff, Bihar; Aurangabad Jagir, Lucknow, Uttar Pradesh; and Hyderabad, Telangana is in various stages of construction. NHB and DFID have also become partners with BMTPC in demonstration housing projects being implemented in three States namely Odisha, Bihar & Uttar Pradesh and providing partial financial support. During implementation, the state level sensitization programmes & workshops are being organized along with hand holding of state engineers so that emerging technologies can be mainstreamed.

Through Gazette Notification (No. I-16011/5/99 H-II in the Gazette of India No. 49 dated December 4, 1999), BMTPC is authorized to evaluate and certify prospective construction systems & new materials and products. During the year, emerging technologies namely, Structural Stay-in-place Formwork System, Monolithic Insulated Concrete System (MICS), Lost-in-Place Formwork system – Plasmolite Wall Panels, Lost-in-Place Formwork System – Plaswall Panels, Resin Bonded (Plastic Waste) Tiles have been awarded certificate under the Performance Appraisal Certification Scheme (PACS) of BMTPC and a number of them are being evaluated namely Cellular Lightweight Sugarcane Bagasse Ash Bricks (CSAB), Nano Living System, Flyash EPs (beads) Cement Sandwich Panels, Dry Wall Pre-fab Panel System, Continuous Sandwich (PUF) Panels, Bau Panel System, etc. The Council has prepared 2nd edition of Compendium of Prospective Emerging Technologies which covers 16 emerging technologies. Till date, BMTPC has issued Performance Appraisal Certificates (PAC) for 52 products/systems covering various items.

BMTPC has been proactively supporting and working as a technical resource institution for Ministry of Housing & Urban Affairs's Mission schemes and extending its technical support for appraising, monitoring, review of Third Party Inspection & Monitoring (TPIM) and handholding of ULBs under PMAY(U), etc. The Ministry of Housing & Urban Affairs has set up a Technology Sub-Mission under Pradhan Mantri Awas Yojana (Urban) - Housing for All Mission which is working on promotion and large scale adaption of new construction technologies and alternate building materials by the State Govts. in collaboration with IITs and NITs. BMTPC is working as secretariat of the Technology Sub-Mission. The Council has been designated as one of the agencies for

scrutiny of the projects received under Housing for All (Urban) from various States. BMTPC has also been entrusted with the task of educating ULBs & beneficiaries regarding earthquake resistant design and construction specifically for States and regions falling in high seismic zone i.e. IV & V under PMAY(U). BMTPC is also providing technical support in formulation of Global Housing Technology Challenge – India (to be launched soon), an initiative of the Ministry of Housing & Urban Affairs, Government of India which seeks to identify cost-effective and speedy construction technologies.

With the approval of the Cabinet, the Ministry of Housing & Urban Affairs has created a National Urban Housing Fund (NUHF) in BMTPC which would aggregate the loans from lending agencies or financial institutions. Funds raised through Extra Budgetary Resources (EBR) for NUHF are being loaned to BMTPC for its further disbursement as Central assistance to State/UT Governments and as subsidy to the CNAs under the CLSS vertical of the Mission. A Data Resource cum Monitoring Centre (DRMC) is being established through BMTPC for monitoring work, data analysis, compilation & dissemination, generation of periodic reports in electronic form, undertake field visits/physical verification in a friendly manner.


One of the forte of BMTPC has been Disaster Mitigation & Management. BMTPC is committed to promote the proactive approach towards it and has been in the forefront in educating professionals and creating mass awareness amongst various stakeholders including common man. BMTPC developed Mobile Application of the updated Earthquake Hazard Zoning Maps and undertaking second revision of Vulnerability Atlas of India. BMTPC also brought out book on Seismic Retrofitting of Masonry Buildings – A Compilation of Case Studies.

The Council also participated in India International Trade Fair 2017 by putting up an exhibition on Alternate and Emerging Building Materials and Construction Systems at Pragati Maidan, New Delhi. Like preceding years, on the occasion of World Habitat Day 2017, the Council brought out the Special Issue of “Nirman Sarika” on the theme “Housing Policies: Affordable Homes” chosen by the UN-Habitat for the year and organized a painting competition for Differently Abled Children and the winners were felicitated during the World Habitat Day celebrations.

In order to strengthen the knowledge base in the construction sector, the Council has brought out a number of publications during the year namely, Guidelines for utilization of C&D waste, Guidebook for Barbenders - Magdarshika for Barbenders (in Hindi), Guidebook for Shuttering Artisans - Magdarshika for Shuttering Artisans (in Hindi) and Building Materials and Housing Technologies for Sustainable Development. With a focus on development and promotion of innovative building technologies, specific R&D projects have also been initiated. The website of the Council is being updated regularly for inclusion of latest activities and information. There is good response on website in the form of general enquiry about product and services.

It is my privilege to acknowledge the valuable guidance, support and encouragement received from the President and Members of the Board of Management, the Chairperson and Members of the Executive Committee and Ministry of Housing & Urban Affairs for various programmes undertaken and executed by the Council. BMTPC is grateful to NITI Aayog, Parliamentary Standing Committee on Urban Development, PMAY(U)-HFA Mission Directorate, MoHUA, various State Govts., Municipal Corporations and Urban Local Bodies, Ministry of Home Affairs, Ministry of DONER, NDMA, NIDM, MOS&PI, DST, CSIR, IITs, CEPT, IPIRTI, CBRI, SERC, ICI, IIHRD, SEP, SPA, HUDCO, BIS, NHB, NCHF, HPL, CGEWHO, CPWD, NSIC, CIDC, BIPARD, UNDP, UNIDO, RICS school of Built Environment, TAC and UN-Habitat for their continued support and interest in strengthening and supporting the efforts of the Council over successive years.

I would also like to place on record my deep appreciation for the cooperation of officers of BMTPC and its staff members for timely implementation of the Council's activities. The Council acknowledges the support and cooperation received from all officers and staff members of the Ministry of Housing & Urban Affairs, which helped the Council to meet its mandate and further its objectives.



(Dr. Shailesh Kr. Agrawal)  
Executive Director

## CONTENTS

<b>MISSION &amp; VISION.....</b>	<b>1</b>
<b>INTRODUCTION.....</b>	<b>2</b>
<b>MAJOR INITIATIVES AND ACTIVITIES DURING THE YEAR 2017-2018 .....</b>	<b>7</b>
<b>I. MODEL DEMONSTRATION CONSTRUCTION USING ALTERNATE TECHNOLOGIES.....</b>	<b>7</b>
1. Demonstration Housing Projects using Green/Emerging Technologies in different parts of the country .....	7
<b>II. PRADHAN MANTRI AWAS YOJANA – HOUSING FOR ALL (URBAN) MISSION .....</b>	<b>16</b>
1. BMTPC's Role in Implementation of the Pradhan Mantri Awas Yojana – Housing for All (Urban) Mission.....	16
2. Hand-holding of States in Use and Mainstreaming of Emerging Technologies .....	22
<b>III. IMPLEMENTATION OF NATIONAL URBAN HOUSING FUND (NUHF).....</b>	<b>24</b>
<b>IV. DISASTER MITIGATION AND MANAGEMENT .....</b>	<b>31</b>
1. Development of Mobile App on Earthquake Hazard Zoning Maps and Atlases.....	31
2. Third Revision of Vulnerability Atlas of India .....	31
3. Publication of Book on Seismic Retrofitting of Masonry Buildings - A Compilation of Case Studies.....	32
<b>V. STRENGTHENING THE INFORMATION AND DATABASE IN THE CONSTRUCTION SECTOR ....</b>	<b>35</b>
1. Publication of the “Nirman Sarika” – Special Issue of BMTPC Newsletter .....	35
2. Publication of Second Edition of “Compendium of Prospective Emerging Technologies for Mass Housing” .....	35
3. Publication of Pocket book on Emerging Construction Systems .....	36
4. Publication of Guidelines for Utilization of C&D Waste .....	36
5. Publication of “Margdarshika for Barbenders” and “Margdarshika for Shuttering Artisans” .....	39
6. Publication of Book titled “Building Materials and Housing Technologies for Sustainable Development” .....	40
7. Information Dissemination through Website of the Council .....	41
8. Standardization and Product Evaluation.....	41
<b>VI. PROMOTIONAL AND CAPACITY BUILDING ACTIVITIES AT NATIONAL AND INTERNATIONAL LEVEL.....</b>	<b>44</b>
1. Organization of National Seminar on Emerging Building Materials and Construction Technologies at New Delhi.....	44
2. Organization of National Workshop on “Processing and Use of Construction & Demolition Waste” at New Delhi .....	47
3. Organization of National Workshop on “Management of Construction & Demolition Waste” at Hyderabad .....	48
4. Organization of Rajbhasha Sangoshthi at New Delhi .....	48
5. Setting up of Permanent Display Centre on Emerging Building Materials & Construction Technologies at IIT Kharagpur .....	50

6.	Capacity Building Programmes.....	52
7.	World Habitat Day 2017 Celebrations.....	56
8.	Participation in India International Trade Fair, 2017, Pragati Maidan, New Delhi from 14-27 November 2017 .....	58
<b>VII.</b>	<b>TECHNOLOGY DEVELOPMENT, DIFFUSION AND TRANSFER .....</b>	<b>59</b>
1.	Identification and Evaluation of Emerging Housing Technologies.....	59
2.	Preparation of Second Edition of Compendium of Prospective Emerging Technologies for Mass Housing .....	60
3.	Project on “Estimate of Embodied Energy for Low Carbon Building Construction” .....	61
4.	Project on Structural Stability Assessment and Development of Design Guidelines for Expanded Polystyrene Core Panel System .....	62
5.	Development of Fly Ash based Advanced Ligno-Silico-Aluminous Geo-polymeric Binder useful for making Cement Free Green Concrete.....	64
6.	Development of Commercial Process for Utilization of Pond Ash in manufacture of Cold Setting Building Brick and Block.....	65
7.	Preparation of Video Films on Emerging Technologies .....	65
8.	Development of Mobile Application on Use of bamboo in Housing and Building Construction .....	66
	<b>ORGANISATION.....</b>	<b>67</b>
	<b>STAFF STRENGTH (as on 31.3.2018).....</b>	<b>69</b>
	<b>ACCOUNTS .....</b>	<b>70</b>
	<b>ANNEXURES:</b>	
I.	PARTICIPATION IN NATIONAL AND INTERNATIONAL EVENTS .....	87
II.	PAPERS PRESENTED/PUBLISHED INCLUDING PRESENTATIONS MADE .....	95
III.	PUBLICATIONS BROUGHT OUT DURING THE YEAR .....	97



## Vision

“BMTPC to be world class knowledge and demonstration hub for providing solutions to all with special focus on common man in the area of sustainable building materials, appropriate construction technologies & systems including disaster resistant construction.”

## Mission

“To work towards a comprehensive and integrated approach for promotion and transfer of potential, cost-effective, environment-friendly, disaster resistant building materials and technologies including locally available materials from lab to land for sustainable development of housing.”

## INTRODUCTION

Building Materials & Technology Promotion Council (BMTPC), established in 1990, is an autonomous grant-in-aid organisation of the Ministry of Housing & Urban Affairs, Govt. of India. BMTPC is mandated to promote and transfer cost-effective, environment-friendly, energy-efficient and emerging building materials and housing technologies including disaster resistant construction practices for large scale field application.

In order to meet its objectives, BMTPC initiated several multi-faceted activities enshrined in the mandate of the Council so as to create enabling environment for sustainable building construction. Over the years, the Council has been striving to promote innovative, cost-effective, environment-friendly and energy-efficient alternate building materials and technologies at grass-root level. The Council has also embarked upon the field level application of these materials and technologies through demonstration construction of model demonstration housing including other structures in different parts of India. In its technology development, promotion and dissemination efforts, the Council has promoted various technologies for use in housing and building construction including bamboo based housing solutions. The Council also constructed demonstration structures in the North Eastern Region and helped in setting up Bamboo Mat Production Centres to make available the bamboo mats for the production of bamboo mat related products such as corrugated sheets, bamboo boards, etc. helping in skill development and employment generation.

The Council in recent years has reoriented its approach towards promotion of not only sustainable technologies through intensive evaluation, dissemination but also propagating emerging prefabricated housing technologies from within the country and abroad for social mass housing. The Council is working towards bringing various emerging technologies, which are successful elsewhere in the world, to bring resource efficiency, economy, quality, environmental protection and speed in housing construction.

BMTPC is actively involved in disaster mitigation activities and working in close liaison with NDMA, NIDM and other related Institutions. Apart from bringing out the first ever Vulnerability Atlas of India in 1997 and 2006, the Council is finalising the second revision of its Vulnerability Atlas of India based on 2011 census data. Besides, the Council regularly publishes valuable guidelines/ manuals on disaster resistant construction.

In order to create awareness regarding earthquake resistant design and seismic retrofitting, the Council has undertaken retrofitting of few buildings and organised training programmes for professionals.

Housing for All (Urban) Mission is being implemented by the Ministry of Housing & Urban Affairs. BMTPC is working as Secretariat of the Technology Sub-Mission under Pradhan Mantri Awas Yojana - Housing for All (Urban) Mission set up by the Ministry. The Council has been designated appraisal and monitoring agency under PMAY(U) for projects in various states/UTs falling in Earthquake Zone IV and Zone V. The Council is providing technical support to various State Govts. and other agencies in promotion and adoption of emerging technologies for mass housing. BMTPC is also extending its technical support in formulation of Global Housing Technology Challenge – India, an initiative of the Ministry of Housing & Urban Affairs, Government of India which seeks to identify cost-effective and speedy construction technologies.

With the approval of Cabinet, the Ministry of Housing & Urban Affairs has created a National Urban Housing Fund (NUHF) in BMTPC which would aggregate the loans from lending agencies or financial institutions. Funds raised through Extra Budgetary Resources (EBR) for NUHF are being loaned to BMTPC for its further disbursement as Central assistance to State/UT Governments and as subsidy to the CNAs under the CLSS vertical of the Mission. A Data Resource cum Monitoring Centre (DRMC) is being established through BMTPC for monitoring work, data analysis, compilation & dissemination, generation of periodic reports in electronic form, undertake field visits/physical verification in a friendly manner.

## Objectives

- **Building Materials & Construction Technologies:** To promote development, standardization, mechanization and large scale field application of proven innovative and emerging building materials and technologies in the construction sector.
- **Capacity Building and Skill Development:** To work as a Training Resource Centre for capacity building and promotion of good construction practices to professionals, construction agencies, artisans and marketing of building technologies from lab to land.
- **Disaster Mitigation & Management:** To promote methodologies

and technologies for natural disaster mitigation, vulnerability & risk reduction and retrofitting/ reconstruction of buildings and disaster resistant planning for human settlements.

- **Project Management & Consultancy:** To undertake project management and consultancy services including appraisal, monitoring and third party inspection of housing projects under the various Central/State Schemes.

### Thrust Areas

- Identification, evaluation and promotion of proven and emerging housing technologies available for housing sector nationally and internationally.
- Promoting speed, economy, efficiency and quality in construction.
- Creating enabling eco-system for mass application of technologies through upscaling of technologies, know-how acquisition, absorption and dissemination.
- Field level application of environment-friendly, energy-efficient and disaster resistant technologies for proven, locally available and emerging technologies, through demonstration construction.
- Formulation of Specifications, Schedules, Standards on proven building materials/technologies including emerging technologies/ systems.
- Documentation of benefits, durability and acceptability of cost effective and innovative building materials and technologies.
- Skill upgradation of professionals and construction workers through capacity building programmes, training programmes, seminars, conferences, workshops, exhibitions nationally as well as internationally.
- Promoting disaster resistant construction technologies.
- Appraisal, monitoring and third party inspection of housing projects including undertaking operationalization of Data Resource cum Monitoring Centre (DRMC) under PMAY(U)
- Implementation of National Urban Housing Fund (NUHF) through Extra Budgetary Resources under PMAY(U)
- Project management and consultancy services.
- Publication of user manuals, guidelines, compendiums, directories, brochures, techno-feasibility reports, video films, demonstration CDs, interactive website, blogs including documentation of success stories.

## Administration and Management

BMTPC follows a three-tier system for discharging its administrative and technical duties as given below:

- i. Board of Management headed by Hon'ble Minister of Housing & Urban Affairs
- ii. Executive Committee headed by Secretary, HUA
- iii. Executive Director

The Board of Management of the Council consists of 16 Members from various Ministries and related organisations. The Executive Committee consists of 9 Members from Ministry of Housing & Urban Affairs, Housing & Urban Development Corporation (HUDCO), Central Building Research Institute (CBRI) and Technical Experts. The list of members of the Board of Management and Executive Committee is given hereunder:

### Board of Management (as on 31.3.2018)

S.No.	Members	
1	Shri Hardeep Singh Puri Hon'ble Minister of State (I/C) for Housing & Urban Affairs, Government of India	President
2	Shri Durga Shanker Mishra Secretary Ministry of Housing & Urban Affairs, Government of India	Vice-President
3	Shri Ashok Kr. Jain Senior Advisor (RD & HUA) NITI Aayog, Government of India	Member
4	Dr. M. Ravi Kanth Chairman & Managing Director Housing & Urban Development Corporation (HUDCO)	Member
5	Dr. Arun Kumar Panda Secretary, Ministry of Micro, Small & Medium Enterprises, Government of India	Member
6.	Prof. Ashutosh Sharma Secretary, Ministry of Science & Technology, Government of India	Member
7	Shri Naveen Verma Secretary, Ministry for the Development of North Eastern Region, Government of India	Member
8	Shri R.K. Jain Secretary National Disaster Management Authority, Government of India	Member
9	Dr. Girish Sahni Director General Council of Scientific & Industrial Research Government of India	Member
10	Shri Abhai Sinha Director General Central Public Works Department Government of India	Member

S.No.	Members	
11	Prof. K.N. Satyanarayana Director Indian Institute of Technology (IIT) Tirupati	Member
12	Prof. Sudhir K. Jain Director, Indian Institute of Technology (IIT) Gandhinagar	Member
13	Shri Manoj Kumar Addl. Secretary (Housing) Ministry of Housing & Urban Affairs, Government of India	Member
14	Ms. Jhanja Tripathy Joint Secretary & FA, Ministry of Housing & Urban Affairs, Government of India	Member
15	Shri Amrit Abhijat Joint Secretary & Mission Director (HFA) Ministry of Housing & Urban Affairs, Government of India	Member
16	Dr. Shailesh Kr. Agrawal Executive Director, Building Materials & Technology Promotion Council	Member Secretary

### Executive Committee (as on 31.3.2018)

S.No.	Members	
1	Shri Durga Shanker Mishra Secretary Ministry of Housing & Urban Affairs, Government of India	Chairman
2	Shri Manoj Kumar Addl. Secretary (Housing) Ministry of Housing & Urban Affairs, Government of India	Member
3	Ms. Jhanja Tripathy Joint Secretary & FA, Ministry of Housing & Urban Affairs, Government of India	Member
4	Shri. Amrit Abhijat Joint Secretary (HFA) Ministry of Housing & Urban Affairs, Government of India	Member
5.	Dr. M. Ravi Kanth Chairman & Managing Director, Housing & Urban Development Corporation	Member
6.	Dr. N. Gopalakrishnan Director Central Building Research Institute, Roorkee	Member
7.	Prof. Pradipta Banerji Head, Centre for Urban Science & Engineering Deptt. of Civil Engineering, IIT Bombay	Member
8.	Shri J.S. Gopinath Director & Chief Architect JSKM Architecture, Interiors Qube, Hyderabad	Member
9.	Dr. Shailesh Kr. Agrawal Executive Director, Building Materials & Technology Promotion Council	Member - Secretary

---

## MAJOR INITIATIVES AND ACTIVITIES DURING THE YEAR 2017-2018

### I. MODEL DEMONSTRATION CONSTRUCTION USING ALTERNATE TECHNOLOGIES

#### 1. Demonstration Housing Projects using Green/Emerging Technologies in different parts of the country

The Council has been promoting proven and emerging building materials & technologies in different regions of the country through identification, evaluation, standardization, certification, capacity building and field level application of such technologies. The council, during recent past, has constructed a number of demonstration houses in various parts of the country. The efforts of the Council have helped in building up confidence and acceptability of proven and emerging technologies in public & private construction agencies, professionals etc.

BMTPC is also constructing Demonstration Housing Projects in different parts of India using emerging technologies with the objective of spreading awareness about new technologies and disseminate technical know-how in the states under the Pradhan Mantri Awas Yojana (Urban) – Housing for All Mission. The Council earlier completed a Demonstration Housing Project consisting of 36 Demonstration Houses and a Community Centre using GFRG & alternate technology in August, 2016 at Nellore, Andhra Pradesh. The status of the other projects at various locations are given below:

##### (a) Demonstration Housing Project at Bhubaneswar, Odisha

BMTPC has completed construction of 32 Demonstration Houses (G+3) using Expanded Polystyrene Core Panel System (EPS) Technology. In response to proposal of the Ministry of Housing & Urban Affairs, Govt. of India to partner the Demonstration Housing Project in the State, the Housing & Urban Development Department, Government of Odisha indicated interest and thereafter Bhubaneswar Development Authority (BDA) allotted 0.43 acres land for construction of Demonstration Houses by BMTPC with Expanded Polystyrene Core Panel System (EPS) Technology at Chandrashekharpur, Bhubaneswar, Odisha. The plan, sections, layout plan of Demonstration Housing Project was finalised in discussion with Bhubaneswar Development Authority (BDA).

Besides Pradhan Mantri Awas Yojana (Urban), the other Partnering & Funding agencies for the project are Department For International Development (DFID) & National Housing Bank (NHB). DFID and



**Demonstration Houses constructed using EPS technology by BMTPC  
at Bhubaneswar, Odisha**

NHB is working on “Making affordable housing market work for faster & sustained economic growth” in eight identified low income States in India and one of the strategies is to test innovative technologies and approaches for Green construction. Under this strategy, NHB and DFID have become partners with BMTPC in demonstration housing project implemented in Odisha and provided partial financial support.

The project also includes on-site infrastructure work such as construction of pathways, boundary wall, water supply work, horticulture work, drainage & disposal and external electrification using solar panels etc.

The details of the project are as follows:

***Project Profile***

- No. of houses : 32 (G+3)
- Carpet area of each unit : 23.97 sqm.
- Built up area of each unit including common area : 34.10 sqm.
- Total built up area under the project is 11,782 sq.ft.
- Each Unit consists of One living room, one bedroom, cooking space, Bath and WC.
- Includes Earthquake Resistant Features.



### ***Technologies/Specifications for Demonstration Houses***

#### *Foundation*

- Strip foundation in M-25 Concrete

#### *Structural System*

- RCC framed structure
- Expanded Polystyrene Core Panel System with Sprayed Concrete Structural Plaster for wall/slab/roof

#### *Door frames*

- Pressed Steel Door Frame with flush door shutter
- PVC door frame & shutter in toilet

#### *Window frames*

- MS Section window frame with guard rail and glazed shutter

#### *Flooring*

- Ceramic tile flooring in rooms
- Ceramic tile flooring in WC & Bath
- Kota stone in passage

#### *Kitchen Counter*

- RCC cooking counter top with marble

#### *Staircase*

- RCC staircase with kota stone flooring

#### *Wall finishes*

- Oil bound distemper on internal wall surface
- Weather resistant paint on external wall surface

#### *Others*

- Common area lighting with solar panels
- Pathways with concrete pavers

The project has been completed and handed over to State Government on 13th December, 2017. The project has evinced interests amongst construction fraternity and the project has already been visited by number of professionals, entrepreneurs and developers.

### **(b) Demonstration Housing Project at Biharshariff, Bihar**

The Govt. of Bihar has designated Biharshariff Nagar Nigam as nodal agency for the demonstration project. The site for the demonstration project in Biharshariff has been identified and 1350 sqm. of land has been allotted for the purpose by local administration. Based on the interaction & consultation with Biharshariff Nagar Nigam, the housing technology were identified and building drawings were finalized.

The demonstration houses comprising of 36 DUs (G+2) is being constructed using one of the emerging technology i.e. Monolithic

Construction with Structural Stay-in-Place CR Steel Specially Designed Formwork System (Coffor).

Besides Pradhan Mantri Awas Yojana (Urban), the other Partnering & Funding agencies for the project are Department For International Development (DFID) & National Housing Bank (NHB).

The infrastructure works include internal road, pathways, boundary wall, septic tank, external electrification and water supply work, horticulture work, drainage & disposal, etc.

The details of the project are as follows:

#### ***Project Profile***

- Number of Houses 36 (G+2)
- Carpet area of each unit : 29.67 sqm.
- Built area of each unit including common area : 45.54 sqm.
- Each residential unit consists of a multi-purpose room, a bedroom, kitchen, separate bathroom and W.C.
- Includes Earthquake Resistant Features.

#### ***Technologies/Specifications for Demonstration Houses***

##### *Foundation*

- RCC column foundation

##### *Wall/Slab/Roof*

- Structural Stay-in-Place CR Steel Specially Designed Formwork System (Coffor)
- RCC Slab

##### *Door frames*

- Pressed Steel Door Frame instead of wood
- Flush door shutters as wood substitute
- PVC door frame & shutter in toilet

##### *Window frames*

- MS Section window frame with guard rail and glazed shutter

##### *Flooring*

- Ceramic tile flooring in rooms
- Ceramic tile flooring in WC & Bath
- Kota stone in passage

##### *Kitchen Counter*

- RCC cooking counter top with marble

##### *Staircase*

- RCC staircase with kota stone flooring

##### *Wall finishes*

- Acrylic distemper on internal wall surface
- Weather resistant paint on external wall surface



**Demonstration Houses being constructed using Coffor Structural Stay in Place Formwork System by BMTPC at Bihar Shariff, Bihar**

*Others*

- Pathways with concrete pavers

The demonstration housing project consist of two blocks. The casting of 2nd floor slab is completed for 5 units of Block 2. The casting of 1st floor slab is completed for 7 units of Block 1. The casting of 2nd floor slab for 7 units is in progress for Block 1. The fixing of door window frame and plastering work is under progress for units at ground floor levels in both Blocks.

**(c) Demonstration Housing Project at Aurangabad Jagir, Lucknow**

State Urban Development Agency (SUDA), Lucknow has allotted 0.385 hectare of land at Aurangabad Jagir, Tehsil Sarojini Nagar, Lucknow for undertaking the Demonstration Housing Project. Based on the discussions held with SUDA, the emerging technology and the Plan, Sections and Layout Plan of Demonstration Housing Project was finalised. The demonstration housing project is being constructed using emerging technology Stay in Place EPS based Double Walled Panel System (Sismo).

Besides Pradhan Mantri Awas Yojana (Urban), the other Partnering & Funding agencies for the project are Department For International

Development (DFID) & National Housing Bank (NHB).

The onsite infrastructure development works include landscaping, pavements with interlocking tiles, Boundary Wall, Septic Tank, water supply, sewerage, external electrification, Drainage, Tube well, etc.

The details of the project are as follows:

***Project Profile***

- No. of houses : 40 (G+1)
- Carpet area of each unit : 26.40 sqm.
- Built up area of each unit including common area : 40.31 sqm.
- Each Unit consists of One living room, one bedroom, kitchen, Bath and WC.
- Includes Earthquake Resistant Features.

***Technologies/Specifications for Demonstration Houses***

*Foundation*

- RCC column foundation

*Wall/Slab/Roof*

- Stay in Place EPS based Double Walled Panel System (Sismo) for wall/slab/roof

*Door frames*

- Pressed Steel Door Frame instead of wood
- Flush door shutters as wood substitute
- PVC door frame & shutter in toilet

*Window frames*

- MS Section window frame with guard rail and glazed shutter

*Flooring*

- Ceramic tile flooring in rooms
- Ceramic tile flooring in WC & Bath
- Kota stone in passage

*Kitchen Counter*

- RCC cooking counter top with marble

*Staircase*

- RCC staircase with kota stone flooring

*Wall finishes*

- Acrylic distemper on internal wall surface
- Weather resistant paint on external wall surface

The demonstration housing project consists of five blocks. The casting of roof of 1st Floor of Block B and Block C and wall paneling of Mumty completed. The internal plaster work in 20 units at ground



**Demonstration Houses being constructed using Coffor Structural Stay in Place Formwork System (16 houses) and Light Gauge Steel Frame System (16 houses) by BMTPC at Gachibowli, Hyderabad, Telangana**

floor is completed. The external plaster work at ground floor is under progress. Boundary wall and road from main road to main gate of site has also been completed.

#### **(d) Demonstration Housing Project at Hyderabad, Telangana**

Telangana State Housing Corporation Limited (TSHCL), Hyderabad has allotted 1085 sq.mts. of land at Nirmithi Kendra, Gachibowli, Hyderabad for the Demonstration Housing Project. Based on the discussions held with the officials of TSHCL the Plan, Sections and Layout Plan of Demonstration Housing Project was finalised.

In order to demonstrate different emerging technologies, the Council, two blocks for 32 Demonstration Houses (G+3) using two different technologies i.e (i) Monolithic construction with structural stay in place CR steel specially designed formwork system (16 houses) and (ii) Light Gauge Steel Framed Structure (16 houses) are being constructed under the project.

The DUs have carpet area of 38.74 and 39.50 sq.mts. and built up area of each DU is 53.18 and 53.10 sq.mts. Each DU comprised of two bedrooms, multi-purpose room, kitchen, two WC & bathroom.

The onsite infrastructure development like internal road, pathways, Septic tank, external electrification and water supply work, horticulture work, drainage & disposal, etc. are also part of the project.

The details of the project are as follows:

***Project Profile***

- No. of houses : 32 (G+3)
- Carpet area of unit : 38.74 sqm. & 39.50 sqm.
- Built up area of unit including common area : 53.18 sqm. & 53.10 sqm.
- Each Unit consists of One living room, two bedroom, kitchen and two Bath with WC.
- Includes Earthquake Resistant Features.

***Technologies/Specifications for Demonstration Houses***

*Foundation*

- RCC column / Coffor wall foundation

*Wall/Slab/Roof*

- Structural stay in place CR steel specially designed formwork system
- Light Gauge Steel Framed Structure (LGSFS)
- RCC Beam / LGSFS slab

*Door frames*

- Pressed Steel Door Frame instead of wood
- Flush door shutters as wood substitute
- PVC door frame & shutter in toilet



**Demonstration Houses being constructed using Stay in Place EPS based double walled panel System by BMTPC at Aurangabad Jagir, Lucknow, Uttar Pradesh**

*Window frames*

- MS Section window frame with guard rail and glazed shutter

*Flooring*

- Ceramic tile flooring in rooms
- Ceramic tile flooring in WC & Bath
- Kota stone in passage

*Kitchen Counter*

- RCC cooking counter top with marble

*Staircase*

- RCC staircase with kota stone flooring

*Wall finishes*

- Acrylic distemper on internal wall surface
- Weather resistant paint on external wall surface

The casting of mummy slab for Coffor Block is under progress. The internal plaster work in ground floor and 1st floor is completed. The plastering work in 2nd floor is under progress. The casting of roof truss for LGFS Block is under progress. The fixing of boards in walls is under progress.

***Setting up of a Technical Group for monitoring the progress of Demonstration Housing Projects and Propagating emerging technologies***

A Technical Group, comprising of State Representatives, Engineers from local bodies and academicians has been constituted to monitor the progress of Demonstration Housing Projects (DHP) and also to propagate the emerging technologies used in the projects. During the year, Technical Group meetings were conducted at following DHP sites being implemented by BMTPC:

- a) Bhubneshwar, Odisha, held on August 17, 2017
- b) Hyderabad, Telangana held on August 31, 2017.
- c) Lucknow Uttar Pradesh held on September 12, 2017

***Evaluation & Documentation of ongoing Demonstration Housing Projects (DHPs) on Sustainable & Green Parameters***

Following Institutions have been involved for evaluation and documentation of ongoing Demonstration Housing Projects of BMTPC:

1. SPA, New Delhi – for Bhubaneshwar
2. IIT Kanpur – for Lucknow
3. IIT Hyderabad – for Hyderabad
4. IIT Roorkee – for Biharshariff

## II. PRADHAN MANTRI AWAS YOJANA – HOUSING FOR ALL (URBAN) MISSION

### 1. BMTPC’s Role in Implementation of the Pradhan Mantri Awas Yojana – Housing for All (Urban) Mission

The Ministry of Housing & Urban Affairs, Government of India is implementing “Pradhan Mantri Awas Yojana (Urban) - Housing for All” Mission. The Council has been designated appraisal and monitoring agency under Pradhan Mantri Awas Yojana (Urban) for projects in various States/UTs falling in Earthquake Zone IV and Zone V and undertake TPIM review and capacity building of functionaries of state local bodies. During the year, the Council has undertaken the following activities as per the direction of the Ministry:

#### **Site Scrutiny along with DPR Desk Scrutiny of projects under BLC vertical of PMAY (U)**

1. Scrutiny of DPR and site visit of the Beneficiary Led Construction Project of 258 DUs in Landhaura city, Uttarakhand on 7-8 September, 2017 under PMAY
2. Scrutiny of DPR and site visit of the Beneficiary Led Construction Project of 717 DUs in Srinagar city, J & K on 5-6 September, 2017 under PMAY
3. Scrutiny of DPR and site visit of the Beneficiary Led Construction Project of 691 DUs in Laksar Town, Uttarakhand on 22 Dec 2017
4. Scrutiny of DPR and site visit of beneficiary led Construction (1558 DUs) at Naharlagun Arunachal Pradesh on 17<sup>th</sup> -18<sup>th</sup>, January 2018
5. Scrutiny of DPR and site visit of construction of 191 Enhancement DUs under beneficiary led Construction at Kathua Town, Jammu & Kashmir on 24<sup>th</sup> February, 2018.
6. Scrutiny of DPR and site visit of construction of 1200 New DUs under beneficiary led Construction at Sopore Town, Jammu & Kashmir on 25<sup>th</sup> -26<sup>th</sup> February, 2018.
7. Scrutiny of DPR and site visit of construction of 431 DUs (419 New DUs & 12 DUs Enhancement) under beneficiary led Construction at Jawali, Himachal Pradesh on 22.03.2018.
8. Site Scrutiny along with DPR Desk Scrutiny of project of OF



New Construction – 5361 DUs In Aizawl City, Mizoram, Under BLC vertical of PMAY (U) on 21-23 March, 2018

**Random Quality check/ Monitoring of project under Rajiv Awas Yojana (RAY)**

1. Leh Old Town Up-gradation under RAY (Pilot) Scheme Jammu & Kashmir during May 18-19, 2017
2. RAY Project with Construction of 256 Houses & infrastructure at Palin, Arunachal Pradesh during May 07-09, 2017
3. RAY (Pilot) Project with construction of 142 DUs (78 Single units for families having their own land and 64 units in multi-structure, G+3 as rental housing for families not having own land) & infrastructure at Zuangtui in Aizawl, Mizoram during November 07-09, 2017
4. RAY Projects at Amarpur in Tripura, for construction of 598 new DUs and up gradation of 96 DUs during November 22-25, 2017
5. RAY Projects at Sabroom in Tripura, for construction of 331 new DUs and up gradation of 72 DUs during November 22-25, 2017
6. RAY Projects at Kumarghat, in Tripura, for construction of 507 new DUs and up gradation of 111 DUs during November 22-25, 2017
7. RAY Projects at Khowai, Tripura, for construction of 591 new DUs and up gradation of 699 DUs during November 22-25, 2017
8. Construction of 576 Rental Houses & infrastructure at Chimpu village, Itanagar (Arunachal Pradesh) on 16th March 2018.
9. Construction of 320 Houses & infrastructure at Dirang (Arunachal Pradesh) on 15<sup>th</sup> March 2018.
10. Construction of 384 Houses & infrastructure at Bomdila (Arunachal Pradesh) on 15th March 2018.

**Random Quality check/ Monitoring Report of AHP projects under PMAY (U)**

1. 4369 DUs in Different Nine Location in Ahmedabad City area Gujarat on June 01, 2017.

2. Construction of 136 DUs, Rehabilitation of New Modi Nagar Slum Area under Pradhan Mantri Awas Yojna-(HFA) at Mota Mava-Munjka, TP-9, FP-19/C in RUDA area Rajkot Gujarat on June 02, 2017.

#### **Appraisal under erstwhile RAY**

1. Revised DPR of In-Situ Redevelopment of north Palanpur for Dwelling units of 1776 DUs at R.S. no. 128 and 129, near Mansarovar lake area Palanpur, Gujarat was appraised.

#### **Progress under the Technology Sub-Mission**

A Technology Sub-Mission has been set up under “Housing for All (Urban) Mission” with the objective of providing “Sustainable Technological Solutions for Faster & Cost Effective Construction of Houses suiting to Geo-Climatic and Hazard Conditions of the Country”. The Technology Sub-Mission facilitates adoption of modern, innovative and green technologies and building material for faster and quality construction of houses. Technology Sub-Mission also assist States/Cities in deploying disaster resistant and environment friendly technologies in collaboration with IITs/NITs/ SPAs. BMTPC is working as Secretariat of the Technology Sub-Mission with Executive Director, BMTPC as its Member Secretary.

1. The following proposals submitted under Technology Sub-Mission, Pradhan Mantri Awas Yojana (Urban) were reviewed by BMTPC alongwith representatives of HSMI & HPL in the meetings held on 21<sup>st</sup> August, 2017 and 15<sup>th</sup> September, 2017.
  - a) “Evaluation of Design Efficiency and Cost Impact of Monolithic Construction System to Develop Manual of Specifications, QA/QC procedures, BoQ/Schedule of items and Project Management Guidelines”, submitted by School of Planning and Architecture, New Delhi.
  - b) “Development of cost effective technique using Vernacular Building System(s) found in Central Region of India under HFA” submitted by School of Planning and Architecture, New Delhi.
  - c) “Modular Design Protocol for open-industrialized mass housing using 3S technology and expanded polystyrene core panels for market driven low and mid groups in India” submitted by IIT Roorkee.

2. Organized a meeting chaired by the then Addl. Secretary (Housing) with IITs & NITs on Regional Hubs/Tech Park held at BMTPC on May 30, 2017.
3. Comments submitted to the Ministry for the following project proposal under Technology Sub-Mission:
  - a. Project proposal on “Design and development of sustainable construction materials using blended boiler ashes” submitted by VNIT, Nagpur
  - b. Plan of Action for implementation of GFRG Technology in construction of houses
4. Organized and coordinated an Interactive Session on New Construction Technology for Housing on 18th January, 2018 at New Delhi. The interactive session with the construction agencies and technology providers was organized to receive pinpointed suggestions and recommendations on policy and procurement related issues which could be taken further at the appropriate level so that new technologies could be facilitated for construction of houses under PMAY.
5. IIT Kanpur jointly with BMTPC organized a workshop on “Performance Evaluation of Housing Units” on 21-22 July, 2017 at Noida. During the workshop, “Protocol for Testing of Structural Components and Systems” developed under Technology Sub-Mission of PMAY(U) by IIT Kanpur was also launched. Coordinator on behalf of BMTPC.
6. The Ministry of Housing and Urban Affairs has issued an OM dated 20.03.2018 in which it has been decided that CPWD, DDA & NBCC may adopt the following technologies, which have been validated by BMTPC in all their projects irrespective of location and project cost:
  - i. Monolithic concrete construction system using Aluminium Formwork
  - ii. Monolithic concrete construction system using Plastic - Aluminium Formwork
  - iii. Expanded Polystyrene Core Panel System
  - iv. Light Gauge Sheet Framed Structures (LGSF)
  - v. Industrialized 3-S System using RCC precast with or without shear walls, Columns, beams, Cellular Light Weight Concrete Slabs/Semi-Precast Solid Slab
  - vi. Speed Floor System



**Meeting of Technology Sub-Mission held on May 30, 2017 under the Chairmanship of Addl. Secretary (Housing), Ministry of Housing & Urban Affairs organised by BMTPC**



**Round Table Discussion on Global Housing Technology Challenge - India on August 25, 2017 under the Chairmanship of Secretary, Ministry of Housing & Urban Affairs**

- vii. Glass Fibre Reinforced Gypsum (GFRG) Panel Building System
- viii. Factory Made Fast Track Modular Building System.

7. In order to facilitate adoption of alternate and emerging technologies by the State Governments, Ministry of Housing & Urban Affairs has pursued CPWD, BIS and state departments to come out with notifications, circulars, SORs, specifications etc. which will authorize State Governments to use these new construction technologies in housing projects. During the year, CPWD has included following New Technologies Items in Delhi Schedule of Rates (DSR) 2016 Volume-2 and their detailed analysis is given in Delhi Analysis of Rates(DAR) 2016 (Volume-2).

1. Light Gauge Steel Framed Structures (LGSFS)
2. Expanded Polystyrene Core (EPS Core)
3. Monolithic Concrete Construction by using Aluminium Formwork
4. Prefab Technology
5. Bamboo Technology
6. EPS cement sandwich light weight solid core panels.

8. In the recently published National Building Code 2016 by BIS, provisions have been updated to ensure utilization of number of new/alternative building materials and technologies to provide for innovation in the field of building construction. Updated provisions on new alternate technologies for speedier construction have also been included in Part-5 BUILDING MATERIALS; Part-6 STRUCTURAL DESIGN: Section 7 Prefabrication and Systems Building and Mixed/Composite Construction, 7A Prefabricated Concrete, 7B Systems Building and Mixed/Composite Construction and Part-7 CONSTRUCTION MANAGEMENT, PRACTICES AND SAFETY.

### **Global Housing Technology Challenge – India**

BMTPC is providing technical support in organisation of Global Housing Technology Challenge – India, an initiative of the Ministry of Housing & Urban Affairs, Government of India which seeks to identify cost-effective and speedy construction technologies. The identified technologies with the capability to provide maximum number of houses in minimum time and cost would be mainstreamed into the Indian construction industry and piloted across different climatic conditions of the country. The Ministry is in the final stages of devising this unique competition that would invite proposals from both innovators with proven and tested technologies as well as newly incubated solutions.

### **Data Resource Cum Monitoring Centre (DRMC)**

The Ministry of Housing & Urban Affairs (MoHUA) through BMTPC, intends to set up a Data Resource Cum Monitoring Centre (DRMC) for monitoring work, data analysis, data compilation, data dissemination, generation of periodic reports in electronic form, undertake field visits/physical verification in a friendly manner and also established a separate Monitoring Cell under the Mission Directorate in Nirman Bhawan for ease of data collection, analysis and generation of various housing and infrastructure reports, progress of construction etc. on day to day basis.

## **2. Hand-holding of States in Use and Mainstreaming of Emerging Technologies**

BMTPC has been providing technical support and handholding various states/departments for identifying and finalizing new technologies including attending pre-bid meetings and other discussions.

- Government of Jharkhand has invited BMTPC as technical member in the evaluation committee for their project of 40000 EWS houses to be constructed under AHP vertical of PMAY using emerging technology. BMTPC has guided them in preparing the EoI w.r.t. eligibility conditions for new technologies and also provided important inputs during the pre-bid meetings.
- Jharia Rehabilitation & Development Authority, Dhanbad requested BMTPC for technical vetting of DPR of 40,000 houses using emerging technology for resettlement and rehabilitation of fire and subsidence affected people in coal mine area of Jharia. BMTPC appraised the DPR and submitted the report to JRDA based on which further decision is being taken for selection of new technology.
- Representative of BMTPC is the member of the committee constituted by Delhi Urban Shelter Improvement Board (DUSIB) for finalization of their tenders for the work of construction of multi-storeyed housing for EWS. The purpose of representation of BMTPC is to suggest use of emerging technologies for their projects and suitable modifications in the tender document.
- BMTPC is the member of the High level committee constituted by the Government of Kerala to evaluate and recommend

prefab construction technologies for construction of about 5 lakh houses under LIFE Mission of the state. Undersigned has attended the meetings of the committee with the Executive Director. BMTPC has provided key inputs with regard to identification and selection of technologies for the LIFE Mission.

- BMTPC provided technical support to Uttarakhand through their consultants, WAPCOS Ltd, in identification and selection of appropriate technology for affordable housing projects under PMAY (Urban). Based on the inputs provided by BMTPC, DPR was prepared with RCC monolithic technology for around 2000 houses in Rudrapur.
- Haryana State Industrial and Infrastructure Development Corporation (HSIIDC) has requested BMTPC for providing Project Management Consultancy for their projects of affordable housing for industrial workers in Haryana. In this regard, the meeting was convened by HSIIDC in their head office at Chandigarh. The Modalities and scope of work was discussed during the meeting.
- BMTPC is providing technical support to APTIDCO for construction of houses being constructed under PMAY (U) using monolithic concrete construction technology.

### **III. IMPLEMENTATION OF NATIONAL URBAN HOUSING FUND (NUHF)**

The Cabinet in its meeting held on February 20, 2018 has approved, inter-alia, the proposal of the Ministry of Housing and Urban Affairs as under:

- a) Raising of funds through Extra Budgetary Resources (EBR) to the extent of Rs.60,000 crore through a lending agency or financial institution, over four years, for PMAY (Urban) projects, in consultation with the Ministry of Finance;
- b) BMTPC to take loan on behalf of Government of India and disburse to the States/UTs and Central Nodal Agencies (CNAs), on the advice of the Ministry of Housing and Urban Affairs, for PMAY (Urban);
- c) Government of India will amortize the loan and fulfill the repayment obligations at the agreed upon terms and conditions as decided by the Ministry of Finance.

2. In terms of the proposal approved by the Cabinet, a National Urban Housing Fund (NUHF) has been created in BMTPC which would aggregate the loans from lending agencies or financial institutions. Funds raised through EBR for NUHF will be loaned to BMTPC for its further disbursement as Central assistance to State/ UT Governments and as subsidy to the CNAs under the CLSS vertical of the Mission.

3. For implementation of the Cabinet, BMTPC has opened a dedicated Bank Account in State Bank of India, got registered with PFMS to operate EAT (Expenditure, Advances & Transfer) module of PFMS under the specific scheme code of 'PMAY(U) – Extra Budgetary Support'. The Board of Management of BMTPC in its meeting held on February 26, 2018 has approved amendments in the Memorandum of Association of BMTPC and resolved that all action should be expeditiously taken to operationalise the decisions of the Government in the matter with immediate effect.

4. In this connection, a number of meetings have been held with the officials of Ministry of HUA regarding operationalization of the NUHF and it was agreed that BMTPC will release the funds to the States/UTs and Central Nodal Agencies (CNAs), on the advice of the Ministry of Housing and Urban Affairs, for PMAY (Urban).

5. In this regard, the Department of Economic Affairs, Ministry of Finance has sanctioned and released an amount of Rs. 8000 Crore to BMTPC from NSSF and the same has been released to



the State/UT Govts. as per sanction letters issued by the Ministry of Housing & Urban Affairs. The details of the releases made during the year are as follows:

S. No.	Details	Amount in Rs.
1	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Andaman & Nicobar for 1 BLC Project (Sanction Letter No. : I-14011/21/2017-HFA-5/(FTS-9040338)/26.03.18)	2,280,000
2	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Andhra Pradesh for 26 AHP Project (Sanction Letter No. : N-11012/5/2018-HFA-III-UD (CN 9034911)/26.03.18)	4,060,073,000
3	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Andhra Pradesh for 35 BLC Project Sanction Letter No. : (N-11012/5/2018-HFA-III-UD (CN 9034911)/27.03.18)	1,298,640,000
4	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Arunachal Pradesh for 17 BLC Project Sanction Letter No. : (I-14011/32/2017-HFA-V (FTS-9030020)/24.03.18)	95,580,000
5	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Arunachal Pradesh for 6 BLC Project Sanction Letter No. : (I-14011/37/2017-HFA-V (FTS-9033910)/24.03.18)	108,660,000
6	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Assam for 50 BLC Project Sanction Letter No. : (I-14011/30/2017-HFA-V/FTS-9029498)/27.03.18)	806,760,000
7	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Assam for 66 BLC Project (Sanction Letter No. : I-14011/28/2017-HFA-V/ (FTS-9040369)/26.03.18)	820,680,000
8	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Bihar for 17 BLC Project (Sanction Letter No. : N-11011/22/2018-HFA-III-UD(CN-9036956)/27.03.18)	292,200,000
9	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Bihar for 46 BLC Project (Sanction Letter No. : N-11014/10/2017-HFA-III-UD (CN 9027263)/27.03.18)	1,520,640,000
10	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Chhattisgarh for 19 AHP Project Sanction Letter No. : (N-11011/669/2017-HFA-I-MHUPA (FTS-9022388)/27.03.18)	1,047,420,000
11	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Chhattisgarh for 349 BLC Project Sanction Letter No. : (N-11011/669/2017-HFA-I-MHUPA (FTS-9022388)/26.03.18)	3,056,340,000
12	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Dadra & Nagar Haveli for 1 AHP Project Sanction Letter No. : (N-11011/8/2017-HFA-V-DU (FTS: 9029804)/24.03.18)	111,360,000

S. No.	Details	Amount in Rs.
13	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Daman & Diu for 2 AHP Project Sanction Letter No. : (N-11011/7/2017-HFA-V-UD (FTS 9029771)/24.03.18)	17,940,000
14	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Gujarat for 2 AHP Project Sanction Letter No. : (N-11011/829/2017-HFA-4 (CN. 9023702)/26.03.18)	85,512,730
15	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Gujarat for 20 BLC Project (Sanction Letter No. : N-11012/3/2018-HFA -IV (CN 9039397)/27.03.18)	651,300,000
16	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Gujarat for 5 AHP Project (Sanction Letter No. : N-11012/02/2018-HFA-4 (CN 9035995)/24.03.18)	374,760,000
17	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Gujarat for 6 AHP Project (Sanction Letter No. : N-11012/10/2018-HFA-4 (CN 3143663)/24.03.18)	526,620,000
18	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Gujarat for 6 ISSR Project (Sanction Letter No. : N-11012/3/2018-HFA -IV (CN 9039397)/27.03.18)	42,760,000
19	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Haryana for 93 BLC Project (Sanction Letter No. : N-11011/7/2018/HFA-I SECTION (9035770)/26.03.18)	1,081,200,000
20	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for HUDCO NSSF for CLSS Schemes (Sanction Letter No. : I-12012/1/2015-HFA-IV/CN-9022635/26.03.18)	350,000,000
21	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Jammu & Kashmir for 84 BLC Project. Sanction Letter No. : (N-11011/22/2017-HFA I Section (FTS-3144118)/27.03.18)	483,829,300
22	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Jharkhand for 36 BLC Project (Sanction Letter No. : N-11012/2/2018-HFA-III-UD (E 9034796)/27.03.18)	661,440,000
23	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Jharkhand for 7 AHP Project (Sanction Letter No. : N-11012/1/2018-HFA-III-UD (CN 9034546)/24.03.18)	1,609,955,000
24	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Jharkhand for 17 AHP Project (Sanction Letter No. : N-11012/11/2017-HFA-III-UD(CN 9034136)/28.03.18)	2,026,970
25	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 220 BLC Project (Sanction Letter No. : N-11011/38/2017-HFA-III-UD (CN 9029763)/26.03.18)	1,524,780,000

S. No.	Details	Amount in Rs.
26	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 119 BLC Project (Sanction Letter No. : (N-11012/24/2018-HFA-III-UD (E.No. 9039780)/26.03.18)	146,760,000
27	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 234 BLC Project (Sanction Letter No. : N-11012/1/2017-HFA-III (E.No. 9029778)/26.03.18)	937,260,000
28	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 3AHP Project (Sanction Letter No. : N-11011/38/2017-HFA-III-UD (CN 9029763)/26.03.18)	70,620,000
29	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 51BLC Project (Sanction Letter No. : N-11012/6/2018-HFA-III-UD (E.No. 9034913)/26.03.18)	131,220,000
30	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 76 BLC Project (Sanction Letter No. : N-11012/30/2018-HFA-III-UD (E. No. 9039866)/26.03.18)	53,520,000
31	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 10 AHP Project (Sanction Letter No. : N-11011/25/2017-HFA-III-UD (CN 9034131)/23.03.18)	6,594,240,000
32	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 12 AHP Project (Sanction Letter No. : N-11011/21/2018-HFA-III-UD (CN 9036954)/23.03.18)	961,560,000
33	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 110 AHP Project (Sanction Letter No. : N-11012/7/2017-HFA-III-UD (CN 9032788)/23.03.18)	2,897,928,000
34	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Kerala for 52 BLC Project (Sanction Letter No. : N-11011/18/2018-HFA-III-UD (CN 9036664)/27.03.18)	162,420,000
35	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Kerala for 49 BLC Project (Sanction Letter No. : N-11012/5/2017-HFA-III-UD (CN 9032213)/27.03.18)	343,140,000
36	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Kerala for 75 BLC Project (Sanction Letter No. : N-11011/40/2017-HFA-III-UD (CN 9029967)/27.03.18)	833,820,000
37	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Madhya Pradesh for 56 BLC Project (Sanction Letter No. : N-11036/01/2018-HFA-MHUPA (FTS-9039449)/27.03.18)	1,325,940,000
38	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Madhya Pradesh for 1 AHP Project (Sanction Letter No. : N-11011/518/2017-HFA I SECTION (3145170)/24.03.18)	123,388,000

S. No.	Details	Amount in Rs.
39	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Madhya Pradesh for 133 BLC Project (Sanction Letter No. : N-11011/518/2017-HFA I SECTION (3145170)/24.03.18)	2,500,440,000
40	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Madhya Pradesh for 15 AHP Project (Sanction Letter No. : N-11036/01/2018-HFA-MHUPA (FTS-9039449)/27.03.18)	884,580,000
41	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Madhya Pradesh for 340 BLC Project (Sanction Letter No. : N-11011/518/2017-HFA I SECTION (3145170)/24.03.18)	8,144,400,000
42	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Madhya Pradesh for 4 AHP Project (Sanction Letter No. : N-11036/41/2016-HFA-1-MHUPA (E.No. 9017118)/23.03.18)	1,715,040,000
43	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Mizoram for 6 BLC Project (Sanction Letter No. : N-11011/38/2015-HFA-V/(FTS-9023505)/26.03.18)	425,400,000
44	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Mizoram for 7 BLC Project (Sanction Letter No. : I-14011/35/2017-HFA-V (FTS-9031296)/26.03.18)	149,400,000
45	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Nagaland for 2 BLC Project (Sanction Letter No. : I-14011/38/2016-HFA-V /(FTS-9023507)/27.03.18)	11,700,000
46	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the National Housing Bank (NHB) (CLSS for EWS/LIG) (Sanction Letter No. : I-12012/1/2015-HFA-IV (pt.)/EFS-9039509/22.03.18)	6,000,000,000
47	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Odisha for 27 BLC Project (Sanction Letter No. : N-11011/3/2018-HFA-III-UD (CN 9035292)/27.03.18)	156,300,000
48	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Odisha for 88 BLC Project (Sanction Letter No. : N-11011/39/2017-HFA-III-UD (CN 9029876)/27.03.18)	1,031,700,000
49	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Puducherry for 3 BLC Project (Sanction Letter No. : N-11012/10/2018-HFA-V-UD (FTS-9039031)/26.03.18)	77,220,000
50	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Puducherry for 4 BLC Project (Sanction Letter No. : I-14011/41/2017-HFA-V (FTS: 9037950)/26.03.18)	90,660,000
51	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Punjab for 117 BLC Project (Sanction Letter No. : N-11011/7/2018/HFA-I SECTION (9035770)/27.03.18)	637,453,000

S. No.	Details	Amount in Rs.
52	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Rajasthan for 06 AHP Project (Sanction Letter No. : N-11011/521/2017-HFA-1-MHUPA (E. No. 9021648)/23.03.18)	332,160,000
53	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Rajasthan for 9 AHP Project (Sanction Letter No. : N-11011/521/2017-HFA-I-MHUPA (E.No. 9021648)/26.03.18)	318,846,000
54	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Sikkim for 2 BLC Project (Sanction Letter No. : I-14011/27/2017-HFA-V/FTS-9039151/27.03.18)	9,600,000
55	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Tamil Nadu for 34 AHP Project (Sanction Letter No. : N-11011/20/2018-HFA-III-UD (CN 9036778)/24.03.18)	837,060,000
56	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Tamil Nadu for 50 BLC Project (Sanction Letter No. : N-11012/19/2018-HFA-III-UD (CN 9039405)/27.03.18)	1,090,980,000
57	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Tamil Nadu for 6 AHP Project (Sanction Letter No. : N-11012/12/2018-HFA-III-UD (CN 9039157)/24.03.18)	53,700,000
58	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Tamil Nadu for 8 AHP Project (N-11012/3/2018-HFA-III-UD (CN 9034908)/24.03.18)	228,780,000
59	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Telangana for 100 AHP Project (Sanction Letter No. : N-11011/19/2017-HFA-III-UD (CN 9031931)/24.03.18)	4,719,960,000
60	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Telangana for 73 AHP Project (Sanction Letter No. : N-11012/20/2018-Hfa-III-UD (E: 9039595)/25.03.18)	603,703,000
61	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Tripura for 20 BLC Project (Sanction Letter No. : I-12012/4/2016-HFA-V (FTS-9023498)/26.03.18)	174,700,000
62	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Tripura for 20 BLC Project (Sanction Letter No. : I-12012/4/2016-HFA-V (FTS-9023498)/26.03.18)	163,181,000
63	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttar Pradesh for 06 AHP Project (Sanction Letter No. : N-11011/23/2017-HFA-1 SECTION (3144039)/27.03.18)	273,120,000
64	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttar Pradesh for 20 AHP Project (Sanction Letter No. : N-11021/7/2017-HFA.1-MHUPA (E.No. 9019260)/23.03.18)	1,113,622,000

<b>S. No.</b>	<b>Details</b>	<b>Amount in Rs.</b>
65	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttar Pradesh for 44 BLC Project (Sanction Letter No. : N-11011/23/2017-HFA-1 SECTION (3144039)/27.03.18)	547,920,000
66	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttar Pradesh for 644 BLC Project (Sanction Letter No. : N-11021/7/2017-HFA-I-MHUPA (Pt.) (FTS-9039184)/24.03.18)	10,565,798,000
67	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttarakhand for 10 BLC Project (Sanction Letter No. : N-11011/16/2018/HFA-I(FTS 9039239)/28.03.18)	58,380,000
68	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttarakhand for 2 AHP Project (Sanction Letter No. : N-11011/16/2017-HFA I SECTION (E.No. 3144165)/24.03.18)	144,000,000
69	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttarakhand for 75 BLC Project (Sanction Letter No. : N-11011/676/2017/HFA-I SECTION (9022441)/27.03.18)	423,660,000
70	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of West Bengal for 70 BLC Project (Sanction Letter No. : N-11012/2/2017-HFA-III-UD (CN 9031419)/27.03.18)	1,301,964,000
	<b>Total</b>	<b>80,000,000,000</b>

---

## **IV. DISASTER MITIGATION AND MANAGEMENT**

### **1. Development of Mobile App on Earthquake Hazard Zoning Maps and Atlases**

Looking at the overall importance of seismic hazard in Indian context and associated risks involved, the National Disaster Management Authority (NDMA), Government of India entrusted BMTPC the task of preparing updated earthquake hazard maps upto district level. The NDMA-BMTPC While releasing the Earthquake Hazard Maps and Atlases in September 2016, the then Hon'ble Minister had desired that a Mobile App of the Earthquake Hazard Zoning Maps may be developed so that these can be used by masses.

The Mobile App on "Earthquake Hazard Map of India" has been developed by BMTPC. The Mobile App is available on the Google Play Store and Apple App Store for android and iOS users respectively. As a part of Digital India programme of Government of India, the Mobile App will be helpful in providing necessary information with regard to earthquake zonation of the country to the professionals in particular and other users in general.

On the occasion of World Habitat Day celebrations, Shri Hardeep S. Puri, Hon'ble Minister of Housing & Urban Affair, Government of India, launched the Android and iOS based Mobile App on Earthquake Hazard Map of India, in the august presence of Shri Durga Shanker Mishra, Secretary, Ministry of Housing & Urban Affairs on October 5, 2017 at Vigyan Bhawan, New Delhi.

### **2. Third Edition of Vulnerability Atlas of India**

The Council brought out the first ever Vulnerability Atlas of India in 1997 comprising of hazard maps w.r.t. earthquakes, wind/cyclones and floods and district wise vulnerability/risk tables of housing stock based on the types of materials as per census 1991 data. The second edition of the Vulnerability Atlas of India was brought out in 2006. The Vulnerability Atlas of India is often referred and used by disaster management authority of State and Central for disaster management and planning.

The Vulnerability Atlas of India, which contains hazard maps of earthquakes, cyclones and flood and district wise tables of vulnerability of houses, based on the types of walling and roofing as per Census data, is being revised to incorporate latest information regarding existing earthquake zoning map, wind zoning map and flood zoning map and housing statistics as per Census 2011 data.

After interaction with India Meteorological Department, New Delhi; Central Water Commission, New Delhi; Bureau of Indian Standards, New Delhi; Structural Engineering Research Centre, Chennai; National Remote Sensing Centre, Hyderabad and Geological Survey of India, Kolkata, necessary data regarding cyclone, storm surge, earthquakes, seismic & wind zoning, flood prone areas, thunderstorm & landslides incidences were collected and collated. Based on a number of interactions and meetings of the Peer Group, earthquake hazard maps of India & States, Flood Hazard Maps, Thunder Storm Incidence Map and Landslide Incidence maps has been prepared. Wind and Cyclone Hazard Maps has been sent to IMD for their comments and suggestions. District-wise Risk tables based on Census 2011 data has been prepared and is being checked along with all the maps.

### **3. Publication of Book on Seismic Retrofitting of Masonry Buildings - A Compilation of Case Studies**

Buildings can be made earthquake resistant, provided they are designed and constructed, following the provisions of relevant earthquake resistant codes of the country. For masonry buildings, it is necessary that the buildings have earthquake resistant features as per IS 4326:2013 - Code of Practice for Earthquake Resistant Design and Construction of Buildings and IS 13828:1993 – Guidelines for Improving Earthquake Resistance of Low Strength Masonry Buildings as the case may be. Majority of the masonry houses in the country, both stone masonry or brick masonry are found deficient of the necessary earthquake resistant features in them. Fortunately, there are technologies developed with experimental validity to retrofit the buildings to make them safe from collapse against estimated earthquake forces. Amongst the various categories of buildings, life line buildings like schools, hospitals are those, which accommodate larger numbers of occupants while in function and also seen as a central place of shelter during the time of disasters. Retrofitting of such building should be the first priority of any agency. Retrofitting of buildings, though is a concern shown by planners, has not been take up as a mission in a large scale in the country as yet.

BMTPC has been in the forefront of disseminating knowledge in the area of disaster resistant construction and related subjects through Seminars, Workshops, Training Programmes, Guidelines and actual demonstration. Realising the Disaster Risk Reduction process, as one of the important aspect of Disaster Management, BMTPC, not only advocated process of proper Damage Assessment but also the technique of seismic retrofitting of masonry buildings.





**Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs launching the Mobile Application on Earthquake Hazard Maps of India, developed by BMTPC during the World Habitat Day on October 5, 2017 at New Delhi**



**Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs releasing the Book on Seismic Retrofitting of Masonry Buildings - A Compilation of Case Studies brought out by BMTPC during the World Habitat Day on October 5, 2017 at New Delhi**

Besides bringing out necessary guidelines for seismic retrofitting of buildings, actual retrofitting of building were also carried out by BMTPC in association with NCPDP -National Centre for Peoples'-Action In Disaster Preparedness, Ahmedabad for a number of buildings in different parts of the country.

The Damage Assessment reports prepared during Uttarakashi and Latur earthquakes emphasised the importance of retrofitting of the buildings. Continuing with its efforts, retrofitting of lifeline of different types of masonry building were carried out by BMTPC in different regions including Kashmir, Kutch, Uttarakhand and NCR; not only to make those buildings safe but also to educate professionals and common men about the process of the retrofitting exercise.

The Book on "Seismic Retrofitting of Masonry Buildings - A Compilation of Case Studies" covers details of 11 projects of retrofitting of lifeline buildings in urban and rural areas carried out by BMTPC. The projects were undertaken not only to demonstrate the retrofitting technology but also to train local engineers, contractors and building artisans and to create awareness among people at large.

The book was released by Shri Hardeep S. Puri, Hon'ble Minister of Housing & Urban Affair, Government of India, on the occasion of World Habitat Day celebrations on October 5, 2017 at Vigyan Bhawan, New Delhi.

---

## V. STRENGTHENING THE INFORMATION AND DATABASE IN THE CONSTRUCTION SECTOR

### 1. Publication of the “Nirman Sarika” – Special Issue of BMTPC Newsletter

The Ministry of Housing & Urban Affairs celebrated the World Habitat Day on 5th October, 2017 at New Delhi. To mark the occasion, BMTPC brought out a Special Issue of its Newsletter “Nirman Sarika” on the theme “Housing Policies: Affordable Homes”, chosen by United Nations. This special publication focused on the various issues related to the theme of the World Habitat Day besides highlighting the activities of the Council. The “Nirman Sarika” was released by the Hon’ble Minister of State (I/C) for Housing & Urban Affairs during the celebration ceremony of World Habitat Day 2017 held on October 5, 2017 at New Delhi.

### 2. Publication of Second Edition of “Compendium of Prospective Emerging Technologies for Mass Housing”

With the launch of Pradhan Mantri Awas Yojna (Urban), which envisions to provide pucca house to each household of India by 2022, it is incumbent on part of academic, research & other organizations involved in construction to bring innovation & thus paradigm shift in the prevailing construction practices so as to fast-track delivery of houses without compromising structural & functional performance. With this objective in mind, BMTPC initiated identifying, evaluating & certifying new emerging construction systems from all across the globe which can help in replacing the conventional cast-in-situ RCC construction. The first compendium containing a set of such eight technologies were published in 2015.

BMTPC brought out the Second Edition of Compendium of Prospective Emerging Technologies for Mass Housing under the guidance of Technology Sub Mission and Mission Directorate of Pradhan Mantri Awas Yojana. This Compendium containing 16 emerging technologies will be a useful resource for State Governments and related Housing Agencies for construction of and faster delivery of affordable urban housing:

The publication was released by Shri M. Venkaiah Naidu, the then Hon’ble Minister of Urban Development, Housing & Urban Poverty Alleviation and Information & Broadcasting during the National Review/Consultation on Pradhan Mantri Awas Yojana(U) on April 12, 2017 at New Delhi.

### **3. Publication of Pocket book on Emerging Construction Systems**

BMTPC has been promoting alternate cost-effective, environment-friendly, energy-efficient and disaster resistant technologies. Recently, BMTPC took an initiative to study/select emerging and alternate cost effective technologies suitable to Indian geo-climatic conditions and advocate these technologies to the State Govt. for implementation in housing projects under various housing schemes of government in different parts of the country.

In order to mainstream the new emerging technologies, BMTPC have brought out the Pocket Book on Emerging Construction Systems with a view to sensitize professionals including common man. The Pocket Book presents general information on the technologies in pictorial form.

The publication was released by Shri M. Venkaiah Naidu, the then Minister of Housing and Urban Poverty Alleviation along with Rao Inderjit Singh, the then Hon'ble Minister of State of Housing and Urban Poverty Alleviation during the celebration ceremony of World Habitat Day 2016 held on October 3, 2016 at New Delhi.

### **4. Publication of Guidelines for Utilization of C&D Waste**

Swachh Bharat Abhiyan launched in Mission Mode on 2nd October, 2014 aims to make India clean. This Mission, besides other activities, envisages processing of 100 percent solid waste generated in cities / towns by 2nd October, 2019 as key objective, which includes effective management of Construction & Demolition (C&D) waste also.

Construction & Demolition (C&D) waste is the debris which is generated from construction, repair, renovation & demolition of structures. It is a non-hazardous solid waste comprising of range of materials e.g. bricks, mortar, concrete, wood, steel, metal, masonry, gypsum, asphalt etc. All over the world, the useful materials from C&D waste are segregated and reused with little or no processing. The rest of the material can be recycled and gainfully utilized for manufacturing building materials such as aggregates, sand and components such as bricks, blocks, panels etc. The concept is not new and being practiced world over, however in India, it is about time to reorient our approach and treat this refuse as a resource.

The traditional disposal mechanism for C&D waste in India is landfills, which has been a great cause of concern from environmental point of view in urban areas. With the ambitious schemes in the housing



**Shri M.Venkaiah Naidu, the then Hon'ble Minister of Housing & Urban Poverty Alleviation, Urban Development and Information & Broadcasting, releasing the Second Edition of Compendium of Prospective Emerging Technologies for Mass Housing by BMTPC on April 12, 2017**



**Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs releasing the revised Guidelines on Utilisation of C&D Wastes during the National Workshop on "Processing and Use of Construction & Demolition Waste" organised by BMTPC on November 21, 2017 at New Delhi**

sector launched by Govt. of India, where it is envisaged to construct millions of houses by 2022 in urban & rural sector, the amount of C&D waste generated will be several thousand metric tonnes. As per the report, the C&D waste generated per annum in India is about 165-175 metric tonnes during 2005-2013 & it is bound to increase only to add nuisance to the environment. Therefore, it calls for a concerted effort to efficiently utilize this refuse with the know-how already available and make it a viable preposition for the construction sector.

Recently Ministry of Environment, Forest and Climatic Change has notified rules for Management of Construction and Demolition Wastes 2016. Defining duties of Waste Generators, Service Provider and their Contractors, Local Authorities, State Pollution Control Boards, Central Pollution Control Board, Central & State Governments; the notification advocates for proper management of C&D wastes from collection its proper disposal and use. Scientific community involved in construction sector are also concerned about this environmental problem and are working towards making it as a useful resource. In the Waste Management hierarchy minimizing / avoiding generator of wastes, reusing, recycling, recovering, treating and disposal are important in that order.

Realizing that there are no proper guidelines for C&D Waste Management in housing sector, BMTPC initiated a study through Centre for Flyash Research and Management (C-Farm), New Delhi, so as to take stock of present status of generation of C&D Waste in different states and frame certain guidelines for effective management of C&D Wastes in housing sector. The Guidelines so prepared was presented before more than 150 delegates from across the country; representing policy makers, statutory and regulatory bodies, R&D, academic, MoEF&CC, State Pollution Control Boards, Municipal Corporations, Urban Development Authorities, NGOs, representative of Manufacturers, PSUs etc. in a Workshop on 23rd September, 2016. While concurring the Road Map Management Plan and the Guidelines delineated, the deliberation in the workshop also brought to the fore some of the very important aspects and recommendations for efficient and meaningful re-use and recycling of C&D waste.

As an outcome of the above exercise, the Council brought out Guidelines for Utilization of C&D Waste – for Construction of Dwelling Units & related Infrastructure in various Housing Schemes of the Government. It gives estimated quantity of C&D waste generated in mega and metro cities, technical feasibility of recycled use of C&D wastes including quality aspects in housing sector.

A Guide on Environmental Management of Construction and Demolition (C&D) Wastes was also brought out by Central Pollution Control Board, Ministry Environment Forest and Climate Change, Govt. of India in March 2017. CPCB Guidelines address the uses pertaining to abatement of adverse environment impacts arising from C&D Waste management activities. BMTPC & CPCB Guidelines supplements each other.

The Guidelines was released by Shri Hardeep Singh Puri, Hon'ble Minister of State (Independent Charge), Ministry of Housing & Urban Affairs, Government of India during the National Workshop on "Processing and Use of Construction & Demolition Waste" with theme 'Deconstruction & in-situ processing for Ecology and Economics' organised by BMTPC on November 21, 2017 at New Delhi.

#### **5. Publication of "Margdarshika for Barbenders" and "Margdarshika for Shuttering Artisans"**

Capacity building and nation building go hand in hand. Nation cannot progress without human power. Today, in our country, building and housing technologies has progressed fast, especially during the last few decades. But the capacity building and skill development could not keep pace with it. It is visible during the life time of our buildings, especially when the natural disaster struck. This not only involves inappropriate hardship to the occupants and owners of these buildings, but as a result, there is a waste of rare resources of our country which can otherwise be used for development.

The root cause of the poor performance of buildings is low level of skill and technical knowledge in the millions of artisans working on different aspects of traditional construction. Except rare exceptions, none of them have received formal training or formal recognition. An artisan is trained in pieces on the site from those people who have insufficient information on their own. Unfortunately, today, artisans rarely get the opportunity to interact with engineers, and many construction contractors do not even have enough technical information.

Therefore, today's demand is to build the skills and knowledge of these artisans to the desired level, so that they do well, and when they teach other upcoming semi-skilled people on the site, then they teach the right skills and give accurate information. It is also important that the artisans be recognized by certification, which indicates their level of expertise. It requires a certification system which is suited to these working craftsmen, who can provide a

ladder to move forward and contribute to nation building. BMTPC has evolved a building artisan certification system.

Based on the certification system, these guidebooks, in Hindi, have been prepared for Barbenders and Shuttering Artisans engaged in the building construction work. According to the course of this certification, the information needed barbenders and shuttering artisans to create a safe, strong and accurate structure for the construction of buildings of good quality has been included in these guidebooks.

These publications were released by Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs during the celebration ceremony of World Habitat Day 2017 held on 5th October, 2017 at New Delhi.

#### **6. Publication of Book titled “Building Materials and Housing Technologies for Sustainable Development”**

The Council organised a National Seminar on Emerging Building Materials & Construction Technologies on February 22-23, 2018 at New Delhi so as to bring all stakeholders at one platform to share their knowledge and experience. On this occasion, the Council brought out the Proceedings titled “Building Materials and Housing Technologies for Sustainable Development”. The Publication contains 38 papers written by well-known experts and institutions covering different areas of building materials and construction practices. The technical papers encompass the following sub-theme of the National Seminar:

- Advancement in Basic Building Materials - Cement, Aggregate, Concrete, Bricks & Reinforcement
- Bricks & Blocks Masonry including Disaster Resistant construction
- Gainful Utilization of Industrial Waste & Construction Debris
- Emerging Construction Technologies
- Green Construction, Quality Assurance Standardization & Field Level Application

The publication was released by Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs during the National Seminar on Emerging Building Materials & Construction Technologies on February 22, 2018 at New Delhi.



## 7. Information Dissemination through Website of the Council

The Website of the Council ([www.bmtpc.org](http://www.bmtpc.org)) is being visited by professionals and others globally. It is being used as a reference resource in the area of innovative building materials and construction technologies. The website of the Council acts as a repository on alternate building materials and construction in line with its mandate to create enabling environment of affordable housing for all. The Council's website has also been developed in Hindi ([hindi.bmtpc.org](http://hindi.bmtpc.org)) as per the directions of the Rajbhasha Nideshalaya.

There is good response on website in the form of general enquiry about product and services. The website of the Council is regularly updated with latest technical information besides hire and purchase requirements, tender notices, training programmes, Right to Information Act and others as required from time to time.

## 8. Standardization and Product Evaluation

### **Performance Appraisal Certification Scheme (PACS)**

Performance Appraisal Certification Scheme (PACS), being operated by BMTPC (vide Gazette Notification No. I-16011/5/99 H-II in the Gazette of India No. 49 dated December 4, 1999), is a third party voluntary scheme for providing Performance Appraisal Certificate (PAC) to manufacturers or installers of a product which includes building materials, products, components, elements and systems etc. after due process of assessment.

Since the Scheme is operated for the products/systems where no relevant Indian Standards are available, it is required to first work out the desired specifications for Performance Appraisal. For the items where no Indian codes are available, international practices are also being referred. In few cases the specifications recommended by the manufacturers have to be modified based on global practices to improve the quality and performance.

Various states, their Housing Boards and other departments are also promoting and using emerging technologies and materials for construction of mass housing in their states. As such PACS has become an important tool for introduction of emerging technologies in mass housing.

### ***Approval of PACs***

Technical Assessment Committee (TAC) constituted for the purpose

of approval of Performance Appraisal Certificate (PAC) in its 12<sup>th</sup> and 13<sup>th</sup> meetings held on 16<sup>th</sup> June, 2017 and 16<sup>th</sup> February, 2018 respectively has approved issue of PACs for the following new products/systems:

1. Rising EPS (Beads) Cement Panels
2. Structural Stay-in-place Formwork System
3. Monolithic Insulated Concrete System
4. Resin Bonded (Plastic Waste) Tiles
5. Lost-in-place Formwork System -- Plasmolite Wall Panels
6. Lost-in-place Formwork System -- Plaswall Panel System

### ***Approval of Renewal of PACs***

Technical Assessment Committee (TAC) constituted for the purpose of approval of Performance Appraisal Certificate (PAC) in its 12<sup>th</sup> meeting held on 16<sup>th</sup> June, 2017 has approved renewal of PACs for the following products/systems:

1. PVC Profile Doors
2. Under Ground Water Storage Tank (SUMP)
3. Plasto-Crete Panel
4. Insulated Roof Panel
5. Formwork for Monolithic Concrete Construction
6. Walltec Hollowcore Concrete Wall Panel
7. Soundproof Drainage Piping System
8. Speedfloor System
9. Plastic Honeycomb Toilet Structures

### ***Inspection of Works***

Inspection of Works of the following new products/systems has been carried out by the officers of BMTPC and TAC members:

1. Rising EPS (Beads) Cement Panels at New Delhi on 11<sup>th</sup> May, 2017
2. Resin Bonded Tiles (Plastic Waste) on 6<sup>th</sup> & 7<sup>th</sup> November, 2017
3. Monolithic Insulated Concrete System (MICS) on 29<sup>th</sup> & 30<sup>th</sup> November, 2017
4. Lost-in-Place Formwork system - Plasmolite Panels on 26<sup>th</sup> & 27<sup>th</sup> December, 2017
5. Lost-in-Place Formwork system - Plaswall Panels on 26<sup>th</sup> & 27<sup>th</sup> December, 2017

### ***Surveillance Inspection of Works***

Surveillance Inspection of Works of Plastic Honeycomb Toilet Structures at Greater Noida (UP) for renewal of the PACs has been carried out by the officers of BMTPC on 3<sup>rd</sup> May, 2017.

### ***Applications under process for issuance of PACs***

Applications received for issue of PACs are in the pipe line as per the details given below:

1. Cellular Lightweight Sugarcane Bagasse Ash Bricks (CSAB).
2. Nano Living System
3. Precast Hollowcore Concrete Wall Panels.
4. Plaster Aggregate
5. Flyash EPs (beads) Cement Sandwich Panels
6. Dry Wall Pre-fab Panel System
7. Continuous Sandwich (PUF) Panels
8. V-Infill Wall
9. Bau Panel System

### **Technical Inputs to Sectional Committees of BIS**

Apart from PACS, the Council is providing technical inputs to various Sectional Committees of Bureau of Indian Standards for formulation of Indian Standards on various subjects related to Civil Engineering such as Cement and Concrete; Flooring, Wall Furnishing and Roofing Materials; Earthquake Engineering; Housing Prefabricated Construction; Hill Area Development; National Building Code; etc.

## **VI. PROMOTIONAL AND CAPACITY BUILDING ACTIVITIES AT NATIONAL AND INTERNATIONAL LEVEL**

### **1. Organization of National Seminar on Emerging Building Materials and Construction Technologies at New Delhi**

In order to take stock of the recent development in the area of building materials & construction technologies, BMTPC, as part of its endeavour to identify and promote cost effective, environment friendly and disaster resistant building materials and construction processes, organized the National Seminar on Emerging Building Materials & Construction Technologies on February 22-23, 2018 at New Delhi so as to bring all stakeholders at one platform to share their knowledge and experience.

The National Seminar was inaugurated by Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs, Government of India. Hon'ble Minister in his inaugural speech said that considering the present housing shortage in urban areas, more than 1 crore houses in urban areas with necessary infrastructure are required to be constructed. To achieve this, appropriate actions are required at all fronts. This necessarily includes, among other measures, identification and selection of appropriate building materials and technologies to bring not only economy but also quality, durability, speed with due care for safety and environment concern of the country.

Besides Academic, R&D Institutions, known experts of the country; agencies involved in bringing technologies from other countries also participated with their technical presentation and showcasing of products and systems. The representatives of Govt. agencies, faculty & students of technical institutions also participated in the event. More than 350 delegates participated in the Seminar.

To coincide with the National Seminar on Emerging Building Materials & Construction Technologies, an Exhibition on Emerging Building Materials and Construction Technologies showcasing various building products and construction technologies was also organized on February 22-23, 2018 at New Delhi.

Twenty firms/companies displayed following products, technologies and systems for two days:

- EPS Cement Panels
- Structural Stay in Place Formwork System
- Double Walled EPS Panel System
- LGSF System



**Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs inaugurating the Exhibition during National Seminar on Emerging Building Materials & Construction Technologies on February 22-23, 2018 at New Delhi organised by BMTPC**





**Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs releasing the publication titled "Building Materials and Housing Technologies for Sustainable Development" during National Seminar on Emerging Building Materials & Construction Technologies on February 22-23, 2018 at New Delhi organised by BMTPC**



- Lost in Place Formwork System
- Insulated Sandwich Panels, PUF Panels
- Formwork System for Rapid RCC Construction
- Aluminum Formwork for Monolithic Concrete Construction
- Concrewall Panel System
- Bamboo Based Products
- Cement Bonded Particle Board
- Interlocking Compressed Earth Blocks
- Moducast System
- Insulated Concrete Formwork System
- EPS, Flyash Cement Sandwich Wall panels
- Skim Coat for surface finish and Infragreen Cement
- White Cement & Super Cement
- Coatings & Adhesives
- Bio-digester Toilet
- Cement Fibre Boards
- Pre Engineered Buildings
- Polyurethane based coating
- Precast Composite Technologies

On this occasion a publication titled “Building Materials and Housing Technologies for Sustainable Development” and a Mobile App on “Bamboo Housing & Construction” was released by the Hon’ble Minister. The Publication contains 38 papers covering various subjects on the theme of the National Seminar.

## **2. Organization of National Workshop on “Processing and Use of Construction & Demolition Waste” at New Delhi**

BMTPC organized a National Workshop on “Processing and Use of Construction & Demolition Waste” with theme ‘Deconstruction & in-situ processing for Ecology and Economics’ on November 21, 2017 at New Delhi.

The National Workshop was inaugurated by Shri Hardeep Singh Puri, Hon’ble Minister of State (Independent Charge), Ministry of Housing & Urban Affairs, Government of India. Hon’ble Minister in his inaugural speech said that sustainable waste management is the need of the hour keeping in view the ongoing Swachh Bharat Abhiyan of Govt. of India, which involves managing waste in an environmentally sound, socially satisfactory and techno-economically viable manner. The waste management hierarchy demands firstly, avoiding generation of waste, followed by reducing, reusing, recycling, recovering, treating and disposing whatever wastes produced. There is also pressing need to bring awareness about the problem of waste management and the necessity to

adopt proper procedure of collection, processing, recycling and use of C&D wastes in manufacturing of building components among different stake holders of the country.

Shri Durga Shanker Mishra, Secretary, Ministry of Housing & Urban Affairs while addressing the participants pointed out that various Central Schemes such as Smart Cities, Pradhan Mantri Awas Yojana and Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and other similar schemes are bringing increased activities in construction sector. Management and handling of solid wastes including C&D waste is a serious concern and has serious consequences due to the increasing quantum of waste, continuing shortage of dumping sites, and increase in transportation and disposal cost and various associated environmental issues. The construction and demolition waste generated through redevelopment process are required to be utilized as resources to not only reduce the cost of construction but to also help the movement of pollution control.

The National Workshop was organized by BMTPC jointly with Centre for Fly Ash Research and Management (C-FARM), New Delhi in association with Indian Building Congress, Builders' Association of India and IL&FS Academy of Applied Development. The programme was attended by more than 110 participants from research and academic institutions, government organizations, municipal corporations, etc.

### **3. Organization of National Workshop on “Management of Construction & Demolition Waste” at Hyderabad**

BMTPC organized one-day Workshop on “Management of Construction & Demolition Waste” on November 08, 2017 at Hyderabad jointly with Greater Hyderabad Municipal Corporation.

The Commissioner, GHMC and Mayor, GHMC were Chief guests of the programme. The participants included officials of Greater Hyderabad Municipal Corporation such as Chief Engineers of all divisions, engineers, municipal officials etc. More than 140 participants participated in the workshop. Along with various aspects of management and processing of C&D waste, specific issues of GHMC were also covered during the workshop.

### **4. Organization of Rajbhasha Sangoshthi at New Delhi**

In the financial year 2017-18, the Official Language Division of the Ministry emphasized on organizing seminars in order to make Hindi





**National Workshop on “Processing and Use of Construction & Demolition Waste” with theme ‘Deconstruction & in-situ processing for Ecology and Economics’ on November 21, 2017 at New Delhi**



**Seminar on Utilisation of Construction and Demolition Waste organised by BMTPC on November 8, 2017 at Hyderabad**

a working medium in the all offices. Under this direction, BMTPC organized a Rajbhasha Sangoshthi on December 11, 2017 at New Delhi, which was chaired by Chief Guest Shri Dharmendra, Joint Secretary, Administration (Hindi In-Charge), Ministry of Housing and Urban Affairs, Government of India. Representatives of all the establishments under the Ministry and dignitaries involved in the dissemination of official language were invited in the event which highlighted all the points related to Hindi language. The inspiring statements by the dignitaries on the dias, Shri Dharmendra, Joint Secretary (Admn), MoHUA, Shri Puran Chandra Tandon, Lecturer Delhi University, Dr. Mahesh Chandra Gupta, Member Hindi Advisory Committee, Dr. Shailesh Kumar Agrawal, Executive Director, BMTPC, attracted the attention of listeners to the constant prosperity of Hindi.

Shri Dharmendra, Joint Secretary, MoHUA gave inspiring speeches to the “rising phase of the official language”. Shri Tandon emphasized the use of simple language. Dr. Mahesh Chandra Gupta made a deep sense of “use of official language in government work-problems and solutions” and suggested rational measures at every point and the Hindi spelling debate. Dr. Shailesh Kumar Agarwal, Executive Director, BMTPC, highlighted the facts that the the Council has made unprecedented progress in adopting Hindi in writing, competition, files, correspondence, colloquium, which has been encouraged by the Official Language Department of the Ministry to implement it in a compliant manner.

While delivering the vote of thanks, Shri A.K. Tiwari, Chief (PMT & Admin) highlighted the growing phase and progress of Hindi. The audience of the Sangoshthi considered this event as an exemplary and suggested that such seminars may be held regularly in future. There was an enthusiasm in the representatives of all the establishments towards the use of Hindi in their official and daily life.

## **5. Setting up of Permanent Display Centre on Emerging Building Materials & Construction Technologies at IIT Kharagpur**

BMTPC established a Permanent Display Centre on Emerging Building Materials & Construction Technologies at Department of Architecture and Regional Planning, IIT Kharagpur. The Permanent Display Centre consists of display panels and models depicting Demonstration Housing Projects using Green/Emerging Technologies, Agro-industrial waste based building materials, Emerging technologies for mass housing, Performance Appraisal Certification, Bamboo based building materials and components,



**Rajbhasha Sangoshti organised by BMTPC on December 11, 2017 at New Delhi**



**BMTPC established a Permanent Display Centre on Emerging Building Materials & Construction Technologies at Department of Architecture and Regional Planning, IIT Kharagpur on June 2, 2017**

disaster mitigation & preparedness, Pradhan Mantri Awas Yojana (Urban), etc.

The Permanent Display Centre was inaugurated by Dr. Nandita Chatterjee, the then Secretary, Ministry of Housing & Urban Poverty Alleviation, Government of India at IIT Kharagpur Kolkata Centre through video-conferencing in the august presence of Prof. Partha Pratim Chakrabarti, Director, IIT Kharagpur on June 2, 2017 at Deptt of Architecture & Regional Planning, IIT Khagarpur.

## **6. Capacity Building Programmes**

Capacity building and skill development is one of the core activities of BMTPC. BMTPC has planned to organize capacity building programmes in various States to enhance the capacity of engineers & architects. With the emergence of new building materials, advancement of technologies and the need for disaster resistant construction to mitigate the effect of natural disasters, it is important that working professionals regularly update their knowledge and understanding. Realising this need of capacity building of professionals, BMTPC has continued its efforts in organizing structured programmes on subjects related to advancement in the area of building materials for working professionals on regular basis.

Brief on the Training Programme organized during the year are as follows:

- BMTPC constructed Demonstration Houses using emerging technologies at Chandrasekharpur, Bhubaneswar, Odisha. It was planned to organise Sensitisation programmes for professionals at the site during the course of construction. Accordingly, the Council organised one-day Sensitization Programme at Demonstration Housing Project site at Bhubaneswar on May 15, 2017.

A total of 55 engineers and officials of Bhubaneswar Development Authority (BDA), Bhubaneswar Municipal Corporation, State Level Nodal Agency & Jharkhand State participated in the programme. The participants were first taken to the site and all technical details including various connections, shortcreting through automatic machine, quality control measures etc. were explained to the participants. As the building (G+3) using “Expanded Polystyrene core based panel (EPS) system” were almost complete structurally (without finishes) and one sample DU was complete with

---

all finishing & fixtures, the participants had the exposure to all aspects of technology/system. After site visit, participants were given detailed presentation on structural & functional aspects of the technology in the conference hall of BDA. Subsequently, in order to sensitise the officials of Odisha State Police Housing Corporation (OSPHC), the Executive Director, BMTPC made detailed presentation on “Emerging technologies for Mass Housing” before their employees wherein the CMD, OSPHC was also present.

- Organised a one-day Sensitization Programme on “Good Construction Practices and Emerging Technologies for Mass Housing” at Thiruvananthapuram, Kerala on 3<sup>rd</sup> August, 2017. The objective of the Programme was to sensitize and build capacity of the engineers and other stake holders in the area of Emerging Technologies for construction of houses under PMAY (Urban) and other schemes of the state/central Government. Around 60 Participants from Urban Local Bodies, Engineers, Urban Planners, Policy makers and state Govt. departments of Kerala attended the Programme. The programme was inaugurated by Dr.K.T.Jaleel, Hon’ble Minister for Local Self Government Department in the presence of Executive Director, Kudumbashree, Director, Urban Housing Mission Kerala and Executive Director, BMTPC. Technology providers from various companies were invited to make presentation and interact with the participants. Various emerging technologies such as Monolithic Concrete Construction, Glass Fibre Reinforced Gypsum Panel System (GFRG), QuikBuild system panels, Sismo Building Technology, EPS based Panels, Rising EPS (Beads) Cement Panels, Dry Wall Prefab System” were presented during the programme.
- The Parliamentary Standing Committee on Urban Development desired that BMTPC should organize ‘Hands on Training for Fly Ash Brick Manufacturers’ in different regions of the country. Accordingly, provision of two such programmes were kept in Annual Action plan and two training programmes were organised for Fly Ash Manufacturers, one in Cuttack, Odisha on January 30, 2018 wherein 48 participants participated and second in NTPC, Jharli, Jhajjar, Haryana on February 26, 2018 wherein 76 participants participated. The objective of training was to improve the quality of Fly Ash bricks, so as to help establish & popularize it. The training content included fly ash manufacturing technologies, properties of fly ash and other



**Sensitization Programme organised at Demonstration Housing Project site at Bhubaneswar on May 15, 2017**



**Sensitization Programme on "Good Construction Practices and Emerging Technologies for Mass Housing" at Thiruvananthapuram, Kerala on August 3, 2017**



**Hands on Training for Fly Ash Brick Manufacturers organised at Cuttack, Bhubaneswar on January 30, 2018**



**Hands on Training for Fly Ash Brick Manufacturers organised at Jhajjar, Haryana on February 26, 2018**

raw materials relevant to quality of bricks, proportion of raw materials, importance of quality/quantity of water, mould filling and compaction process, hands on training etc. The participants were manufacturers facing quality issues, new entrepreneurs, etc.

## **7. World Habitat Day 2017 Celebrations**

On the occasion of World Habitat Day 2017, the Council conducted the following activities:

### ***Painting Competition for Differently Abled Children***

As a part of the World Habitat Day Celebrations, BMTPC organised Painting Competition for Differently Abled Children on the theme “Housing Policies: Affordable Homes” in the categories viz. (i) Mentally Challenged, (ii) Hearing Impaired and (iii) Visually Impaired children.

In invited 30 schools, 12 schools have taken part in the Painting Competition. From the 196 selected entries sent by the respective Schools, the Jury in BMTPC selected 16 best entries for prizes.

The prizes were awarded to winning entries by Shri Hardeep Singh Puri, Hon’ble Minister of State (I/C) for Housing & Urban Affairs during the celebration ceremony of World Habitat Day 2017 held on October 5, 2017 at New Delhi.

### ***Release of Publications and Launch of Mobile App***

To mark the occasion, following publications were brought out by BMTPC:

- (i) Special Issue of Newsletter “Nirman Sarika” on the theme of the World Habitat Day 2017
- (ii) Seismic Retrofitting of masonry Buildings – A Compilation of Case Studies,
- (iii) Margdarshika for Barbenders, and
- (iv) Margdarshika for Shuttering Artisans
- (v) Mobile Application on Earthquake Hazard Zonation of India

These publications were released by Shri Hardeep Singh Puri, Hon’ble Minister of State (I/C) for Housing & Urban Affairs during the World Habitat Day 2017 function. Hon’ble Minister also launched the Mobile App on “Earthquake Hazard Map of India” on the occasion.





**Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs giving away the Prizes to the winners of Painting Competition of Differently Abled Children organised by BMTPC during the World Habitat Day on October 5, 2017 at New Delhi**



**Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs releasing the Special Issue of BMTPC Newsletter "Nirman Sarika" during the World Habitat Day on October 5, 2017 at New Delhi**

**8. Participation in India International Trade Fair, 2017, Pragati Maidan, New Delhi from 14-27 November 2017**

BMTPC participated in the India International Trade Fair, Pragati Maidan, New Delhi by putting up exhibition on Emerging Building Materials and Technologies. Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs & President, Board of Management, BMTPC, inaugurated BMTPC Display. Besides displaying emerging technologies, models of emerging building materials and construction technologies were displayed for the benefit of the common public. BMTPC Display attracted large number of professional, VIPs, foreign delegation and general public which evinced interest in the various innovative building materials and technologies being promoted by the Council.



**Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs at BMTPC Display during the India International Trade Fair, 2017 at Pragati Maidan, New Delhi**

## VII. TECHNOLOGY DEVELOPMENT, DIFFUSION AND TRANSFER

### 1. Identification and Evaluation of Emerging Housing Technologies

The Council has been studying best-construction practices adopted world over to identify, evaluate and promote suitable technologies suiting Indian geo-climatic conditions on regular basis. In the process, during the year, following technologies were identified, which have potential to be used for mass housing in the country:

#### ***Structural Stay-in-place Formwork System***

The system consists of an integrated formwork, with draining facing panels, self-bracing with relation to the thrust from the fresh concrete. The formwork consists of two panels with vertical stiffening frame work of press-formed steel sheet sections and skin of expanded metal, connected to each other by metal connectors. The panels are manufactured and assembled in the factory.

#### ***Monolithic Insulated Concrete System (MICS)***

Monolithic Insulated Concrete System (MICS) is a system of formwork for reinforced concrete made with a rigid thermal insulation that stays in place as a permanent interior and exterior substrate for walls, floors and roofs. Monolithic Insulated Concrete System (MICS) results in cast-in-place concrete walls that are sandwiched between two layers of modules i.e. Expandable Polystyrene (EPS) separated by hard plastic ties. The modules are interlocking modular units that are dry stacked (without mortar) and filled with concrete once laid out. The units lock together and create a form for the structural walls or floors of a building.

#### ***Lost-in-Place Formwork system – Plasmolite Wall Panels***

Plasmolite Panels are lost in place formwork system where two fibre cement boards (FCB) of 6 mm thickness and High Impact Molded Inserts (HIMI) (spacers) bonded between two sheets of FCB in situ and erected to produce straight to finish walls which are filled with light weight foam concrete. The system may be integrated with conventional column and beam for pre-engineered buildings. This technology may be used as non-load bearing walls for external and internal applications.

#### ***Lost-in-Place Formwork System – Plaswall Panels***

Plaswall Panels are lost in place formwork system, where two fiber

cement boards (FCB) of 6mm thickness each and HIMI spacers (High Impact Molded Inserts) bonded between two sheets of FCB in situ are erected to produce straight-to-finish panels. A monolithic structure is then created by filling the entire structure with M20 or higher grade of concrete as per the design. Additional load capacity can be obtained by providing extra reinforcing bars and/or by increasing grade of the concrete

### ***Resin Bonded (Plastic Waste) Tiles***

Resin Bonded Tiles are manufactured from plastic waste and white sand. The plastic waste is taken from city waste collection centre, dried, segregated, crushed, grinded, separated from metals and formed into plastic chips. Plastic chips are then mixed with sand granules for further processing for production of tiles. These tiles may be used for walls, flooring and roofing depending upon the thickness. The tiles are eco-friendly as these are made by eliminating plastic waste. These tiles are available in attractive designs and colours as per the requirement of customers.

## **2. Preparation of Second Edition of Compendium of Prospective Emerging Technologies for Mass Housing**

As an ongoing activity, the Council has so far under PACS certified 16 new construction systems covering Formwork Systems, Precast Sandwich Panel Systems, Light Gauge Steel Structural Systems, Steel Structural Systems, Precast Concrete Construction Systems, etc. Being regular activity intensive efforts are being taken to identify more technologies. Earlier Compendium of Prospective Emerging Technologies containing eight Emerging Technologies was brought out by BMTPC. Now the same has been updated with additional 8 technologies. The Second Edition of Compendium of Prospective Emerging Technologies for Mass Housing contains technology details of following 16 emerging technologies:

### ***Formwork Systems***

- 1 Monolithic Concrete Construction System:
  - using Plastic - Aluminium Formwork
  - using Aluminium Formwork
- 2 Modular Tunnel form
- 3 Sismo Building Technology

### ***Precast Sandwich Panel Systems***

- 4 Advanced Building System – EMMEDUE
- 5 Rapid Panels
- 6 Reinforced EPS Core Panel System
- 7 QuickBuild 3D Panels

- 8 Concrewall Panel System
- 9 Glass Fibre Reinforced Gypsum (GFRG) Panel System
- Light Gauge Steel Structural Systems**
- 10 Light Gauge Steel Framed Structure (LGSFS)
- 11 Light Gauge Steel Framed Structure with Infill Concrete Panels (LGSFS-ICP)
- Steel Structural Systems**
- 12 Factory Made Fast Track Building System
- 13 Speed Floor System
- Precast Concrete Construction Systems**
- 14 Waffle-Crete Building System
- 15 Precast Large Concrete Panel System
- 16 Industrialized 3-S system using cellular light weight concrete slabs & precast columns

### 3. Project on “Estimate of Embodied Energy for Low Carbon Building Construction”

The Council has undertaken a Project with IIT Roorkee on “Estimate of Embodied Energy for Low Carbon Building Construction”. The objectives of the project are:

- Study of the CPWD Analysis of Rates for material breakups and computation of revised EER values of the items of work using EEV of the individual building materials.
- Upgradation of the existing data on the ‘Schedule of Energy Rates’ to the ‘Schedule of Embodied Energy Rates’.
- Application of the Schedule for a range of case studies for validation.
- Development of a software tool to be able to estimate the Embodied Energy Cost (EEC) of a project through its BOQ using SEER
- Preparation of the SEER Handbook, alongwith the details of the research work done, case studies and application of SEER.

A review of the available sources of information was carried out. The embodied energy estimates were made using these sources and a comparative assessment was made for a few scenarios. For purpose of comparing, all the values are normalized to similar conditions and similar working units. The DA/BMTPC, Final Report on Embodied Energy, was procured from DA. The values published by BVV Reddy from published literature have been referred. ICE version 2 has been considered. With regard to ECO-Invent, the database values from version 3.2 has been referred. It has been concluded that this data for the development of the SEER can be used. At instances where the data is not available; values of embodied energy is taken from values published by BVV Reddy or

from ICE version 2.0.

The revision process also included upgradation of specifications in items of work being followed. This revision accommodates changes in construction practices. In the Item of work compilation, the Analysis of Rates for Delhi, 2014 (published by CPWD), is used along with Delhi Schedule of Rates (DSR). On the basis of analysis of rates, the quantity of material used for each item of work is calculated. Calculations of Embodied Energy for item of works (Embodied Energy Rates) are done in all the intended heads as per Delhi Schedule of Rates to develop SEER (Schedule of Embodied Energy Rates).

As part of applying SEER for various case studies for validation, collection of the BOQ and drawing data of various projects are being done to generate to base case models. The data collected includes few construction projects by NBCC and CPWD, individual houses in area of Uttarakhand and housing projects within IIT Roorkee. Further data collection work is in progress.

Apart from above, the ground work for making the software tool has been done. Initial work on development of software tool is in progress. Preparation of the handbook is in progress and is being done simultaneously along with each objective.

#### **4. Project on Structural Stability Assessment and Development of Design Guidelines for Expanded Polystyrene Core Panel System**

The Council has undertaken a Project for Structural Stability Assessment and Development of Design Guidelines for Expanded Polystyrene Core Panel System with IIT Roorkee. The project has been completed.

Expanded Polystyrene Core Panel System (EPS) is an emerging technology for construction of affordable buildings. In this technique a core of polystyrene is covered with welded wire mesh reinforcement and micro-concrete. This results in a light weight structural system with efficient thermal and acoustic insulation. The system can be used as load bearing wall system in low-rise buildings and as partitions in high-rise RC and steel frame buildings.

An experimental study on mechanical behavior of EPS core based RC sandwich panels is conducted. Small scale wall specimens are constructed using the EPS core, galvanized wire-mesh reinforcement, and micro-concrete (structural plaster), and tested for the inplane shear capacity and out-of-plane flexural behavior.

The EPS panels have been provided by M/S Schnell Homes (India) and the thicknesses of core (80 mm) and outer concrete layers (35 mm each) recommended by them has been considered. The wire reinforcement size (3 mm) and arrangement has also been used as per their manufacturing standards. The outer concrete layers were sprayed using a pneumatic spray gun. The composition and water-cement ratio of the concrete mix has been adopted to get the desired workability for spray application and to achieve the targeted strength of M25. The diagonal compression tests are performed as per the ASTM E519/E519-15 specifications to evaluate the shear strength of the panels and out-of-plane bending tests have been performed using four-point loading arrangement. The strength estimated using these tests has been compared with that using the Indian and other codes for ordinary reinforced concrete panels. It is observed that in absence of more rigorous models for EPC-RC composite panels, the models available in codes can be used for estimating the strength with reasonable conservativeness.

In addition to the simulation of tests on small scale specimens, detailed analysis of a proposed 4 storey (G+3) building has been performed to study its seismic capacity. The building is proposed to have walls consisting of 100 mm thick EPS core and 60 mm thick concrete overlays (total thickness of the walls equal to 220 mm) and slabs having 160 mm thick EPS core, sandwiched between two layers of concrete, upper concrete layer thickness being 50 mm and bottom concrete layer thickness being 30 mm. The building is founded on columns and beams up to the plinth level and the sandwich panels are anchored to the foundation beams using steel dowels. Two types of analysis have been performed. First a simple 'pier analysis' is performed considering idealized modelling of piers as fixed end vertical frame elements and assuming the spandrels to be rigid. In the second case, a finite element model using layered shell element has been developed in SAP2000 Nonlinear software. The pier analysis is used to estimate the equivalent axial force, bending moment, and shear force in the piers, whereas the finite element model is used estimate the stresses and stress resultants in different components and for performing a nonlinear static (pushover) analysis.

Thus, the tests and analysis performed under the study demonstrate that the EPS core based RC sandwich panel system is a viable construction system for seismically safe buildings. The final report also provides modelling guidelines, based on the available literature, for design of such buildings.

## 5. Development of Fly Ash based Advanced Ligno-Silico-Aluminious Geo-polymeric Binder useful for making Cement Free Green Concrete

The Council has undertaken a Project with CSIR-AMPRI, Bhopal on “Development of Fly Ash based Advanced Ligno-Silico-Aluminious Geo-polymeric Binder useful for making Cement Free Green Concrete”. The objective of the project proposed was to develop Fly Ash based Advanced Ligno-Silico-Aluminious Geo-polymeric Binder useful for making Cement Free Green Concrete and Characterization and Evaluation of Engineering Properties of developed materials.

The project has been completed and the major work carried out under the project are:

- Ligno Silico (LS) Alkaline Activator was developed using agro waste i.e. rice husk and alkaline chemical i.e. NaOH.
- Developed LS Alkaline Activator was used for the preparation of Ligno-Silico-Aluminious (LSA) based Geopolymer Concrete for which various mix design was developed by varying the ration LS Alkaline Activator of Fly Ash i.e. 0.41.0.44.0.47 and 0.50 all the cubes were thermal cured at 60oC for 48 hours and maximum compressive strength obtain was 30.8MPa at 0.47 ratio after 28 days.
- As per objective of project for the development of different grades of concrete i.e. M15, M20 and M25 the mix design was developed and as a result by changing the molarity of LS Alkaline Activator using 8.75, 11.25 and 12.5 Molar LS Solution different grades M15, M20 and M25 LSA Geopolymer Concrete was developed for both thermal and ambient cured conditions.
- For optimized composition flexural beam was casted, thermal cured for 48 hours at 60°C and tested at 28 days as a result flexural strength of 3.4MPa, 4.5MPa and 5.2MPa was obtained by using 8.75, 11.25 and 12.5 Molar LS solution.
- For the optimized, LS Alkaline Activator of Fly Ash ratio i.e. 0.47 the cubes and beams were casted and thermal cured at different temperature range i.e. 30°C, 45°C, 60°C, 75°C, 90°C, 105°C, 120°C, 135°C and 150°C while the curing time was 48 hours as a result maximum compressive strength and flexural obtained for sample cured at 120°C i.e. 46.3MPa and 7.75 MPa respectively at 28 days.

The conclusions of the project are:

- The developed LSA based Geopolymer binder is useful for making cement free green concrete.
- Bulk utilization of industrial waste i.e. Fly Ash and agro waste



i.e. Rice Husk for making LSA Geopolymer binder will help in conserving non-replenishable natural resources required in making conventional cement.

## **6. Development of Commercial Process for Utilization of Pond Ash in manufacture of Cold Setting Building Brick and Block**

The Council has undertaken a project on the “Development of commercial process for utilization of pond ash in manufacture of cold setting building brick and block” jointly with CSIR-Institute of Minerals & Materials Technology (IMMT), Bhubaneswar. The objective of the project was to develop a commercial process for the use of pond ash as a raw material along with sand and mineral cementation binder in manufacture of cold setting building brick and block conforming to BIS specification IS: 12894:2002 of Class-7.5 & above.

The project has been completed by carrying out process optimization on laboratory scale experiments by optimizing on pilot scale for manufacture of 70% pond ash content brick and block. The major conclusions of the project are as follows:

- a) The Mineral Cementation process developed at CSIR-IMMT, Bhubaneswar is a green, user friendly, cost effective process in manufacture of cold setting pond ash building brick. Pond ash bricks up to 70% by weight can be manufactured by utilizing this process.
- b) The compressive strength can be increased up to certain extent by increasing the either binder percentage or cement up to certain extent.
- c) Binder should be thoroughly mixed along with the raw material to get the best results with respect to quality of the bricks.
- d) By using this process, bricks can be manufactured at low temperature regions (-20°C) also. Pond ash brick conforms to IS:12894-2002.
- e) Cost economics calculation shows that the payback period for a brick plant of production capacity of 6,000 bricks/day is approximately 3-4 years.
- f) This process knowhow can be licensed to the brick manufacturers interested in producing pond ash bricks.

## **7. Preparation of Video Films on Emerging Technologies**

BMTPC is mandated to identify evaluate and promote emerging construction systems suiting to different geo-climatic conditions of the country, which are safe sustainable environment friendly and ensure faster delivery of quality houses.

The environmental, time and resource constraints of present time demand a paradigm shift in the choice of building materials and construction practices from the traditional like in-situ burnt clay brick masonry and RCC slab to more advanced clean and efficient construction systems.

The Government of India has authorized BMTPC to certify such new systems through Performance Appraisal Certification Scheme 16 such new systems have been evaluated so far which can be broadly classified as Engineer Formwork Systems, Precast Sandwich Panel Systems, Hot Rolled Steel and Cold Formed Light Gauge Steel Structural Systems and Precast Concrete Construction Systems.

In order to promote and mainstream the identified emerging technologies, the Council prepare short duration Video Films on following emerging technologies:

1. EPS based Panel System
2. Monolithic concrete construction
3. Prefabricated Concrete Construction
4. Light gauge steel framed structure
5. Stay in Place Formwork System

Each film of about seven-minute duration covers all aspects of respective emerging technologies.

## **8. Development of Mobile Application on Use of bamboo in Housing and Building Construction**

BMTPC has undertaken development of Mobile Application on “Bamboo in Housing and Building Construction” jointly with South Asia Bamboo Foundation, Guwahati. The Mobile App provides information on technologies and process related to construction of bamboo housing besides other related information. The Mobile App has the following sections:

- About the use of Bamboo in housing & building construction
- Tools required
- Selection of bamboo
- Treatment & preservation of bamboo
- Construction sequence
- Joinery details
- Bamboo toilet
- Indian Standards and reference links

The Mobile App is available on the Google Play Store for android users. This app will be useful particularly to the bamboo workers and other related professionals for construction houses using bamboo.

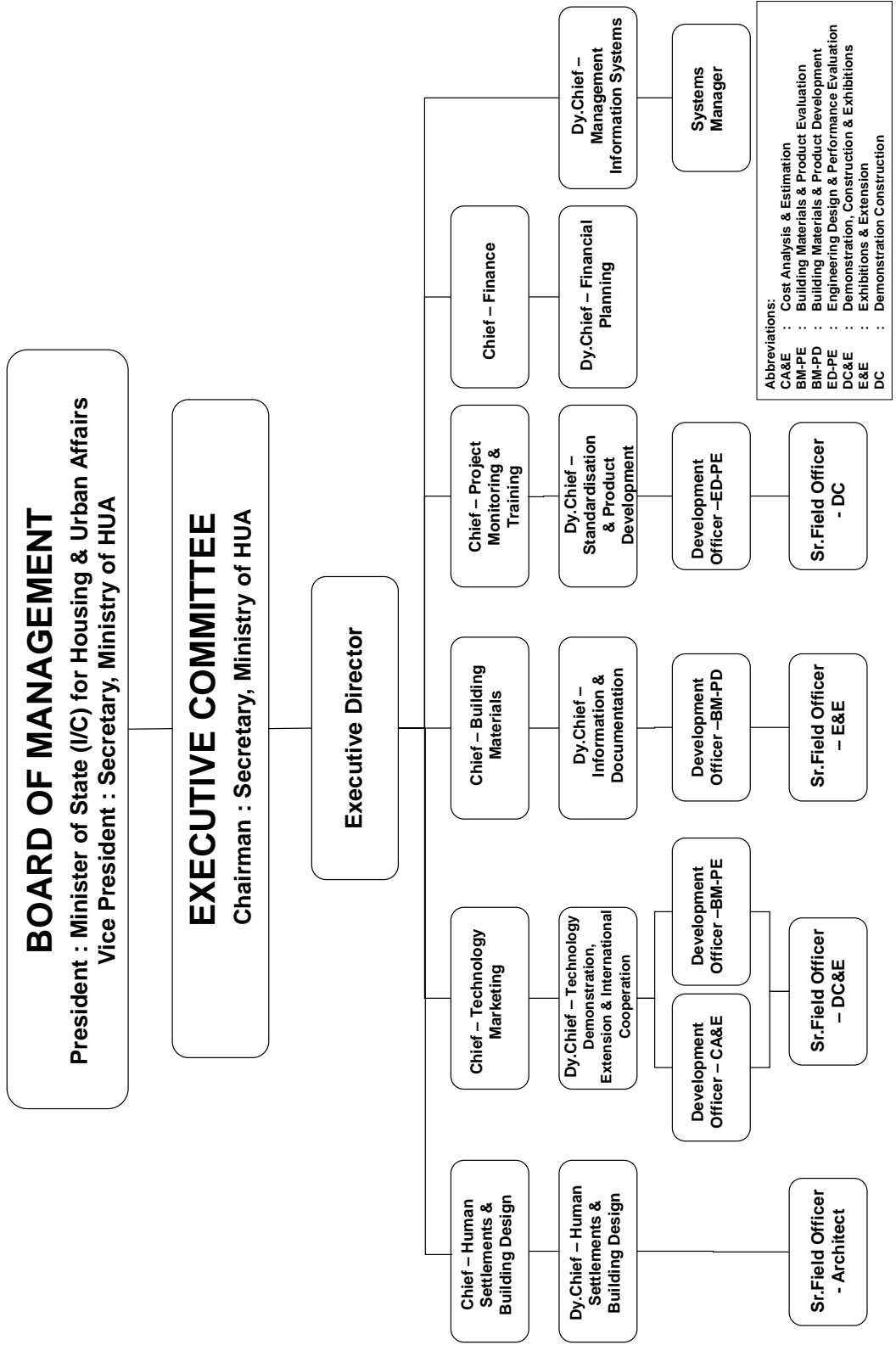
## ORGANISATION

The organizational structure of the Council is depicted at next page. As on 31<sup>st</sup> March, 2018, BMTPC had a staff strength 37 comprising 18 officers and 19 supporting staff. Also technicians/professionals are hired on contract on project and need basis.

The Council has continued following administrative and financial measures for bringing transparency, responsiveness and greater participation of the employees:

- Implementation of modified Byelaws, Recruitment-cum-Promotion Rules and Delegation of Power.
- Internal Committee for smooth and harmonious functioning of the Council:
  - Investment Committee
  - Advertisement Committee
  - Printing Committee
  - Local Purchase Committee
  - Store Purchase Committee
  - Transport Committee
  - Contractual Payment Committee
- To redress citizen grievances, online handling of the public grievances through centralized public grievances redress and monitoring system has been initiated.
- Nominated an officer as the Director of grievances and an officer as Welfare Officer for smooth functioning of the organization and to find out the solution of the grievances of the staff members.
- SCs & STs Cell for welfare and development of Scheduled Casts & Scheduled Tribes
- Implementation of RTI Act, 2005
- Committee for Prevention of Sexual Harassment of women at workplace.
- Independent audit of implementation of Citizen's Charter.
- Independent audit of implementation of public grievance redressal system.

# BUILDING MATERIALS & TECHNOLOGY PROMOTION COUNCIL ORGANISATION CHART



**STAFF STRENGTH (as on 31.3.2018)**

<b><u>S.No.</u></b>	<b><u>Name &amp; Designation</u></b>	<b><u>Date of Joining</u></b>
1.	Dr. Shailesh Kr. Agrawal <i>Executive Director</i>	17.01.08
2.	S.Balasinivasan <i>Chief-Finance</i>	08.04.92
3.	M. Ramesh Kumar <i>Chief- Human Settlements &amp; Building Design</i>	01.04.93
4.	Arun Kumar Tiwari <i>Chief-Project Monitoring &amp; Training and Administration</i>	22.07.03
5.	S.K.Gupta <i>Deputy Chief- Technology, Demonstration Extension &amp; International Cooperation</i>	26.10.93
6.	Arvind Kumar <i>Deputy Chief- Management Information Systems</i>	15.04.99
7.	Chandi Nath Jha <i>Deputy Chief- Standardization &amp; Product Development</i>	09.09.99
8.	Pankaj Gupta <i>Deputy Chief-Information &amp; Documentation</i>	14.10.99
9.	D.P.Singh <i>Development Officer-Engineering Design &amp; Product Evaluation</i>	05.10.98
10.	Dalip Kumar <i>Senior Field Officer- Demonstration Construction &amp; Exhibition</i>	04.03.91
11.	Alok Bhatnagar <i>Senior Field Officer- Exhibition &amp; Extension</i>	05.10.98
12.	Akash Mathur <i>Senior Field Officer- Architect</i>	01.01.02
13.	Anita Kumar <i>Sr. Programmer</i>	03.10.96
14.	M.Ramakrishna Reddy <i>Liaison Officer</i>	29.10.03
15.	Pankaj Gupta <i>Personnel Officer</i>	01.03.94
16.	Praveen Suri <i>Systems Analyst</i>	01.09.94
17.	S.S.Rana <i>Library Officer</i>	01.04.98
18.	D.Prabhakar <i>Field Officer</i>	29.01.04

## ACCOUNTS

- The Council received grants of Rs.300 lakhs from the Ministry of Housing & Urban Affairs, Government of India during the FY 2017-18. The receipts from other sources like Fees, Consultancy, Training, NHB, DRMC, Interest, Publications, etc. were Rs. 513 lakhs.
- In addition, an amount of Rs. 8000.00 Crore was borrowed from National Small Savings Fund (NSSF) on behalf of MoHUA and the same has been disbursed to the States / UTs as per the sanction orders of the MoHUA. An amount of Rs. 526 lakhs was credited in the said NUHF bank account towards interest.
- The total expenditure incurred was Rs. 80,16,17,82,117 during the year, as per Receipt & Payment Account Statement. A summary of expenditure is given below:

Major Heads	Amount (in Rs.)
• Construction of Demonstration Housing Projects in different parts of India & Expenditure on technical activities including Financial Assistance for technology development/ application and Sponsored Studies	8,07,40,464
• Organisation and participation in various Seminars, Conferences, Workshops Housing for All (Handholding, Documentation, Sensitization and Capacity Building), Technology Sub-Mission, Mainstreaming Emerging Technologies through Dissemination, Knowledge Transfer with State Govt.	1,33,78,841
• Expenses towards Capacity Building and Training Programmes and other activities relating to DRMC, Building Centers and others	32,48,325
• Expenditure on Salary, Establishment & Administration expenses including office equipments, computer peripherals, etc.	6,44,14,487
• Central Assistance under Pradhan Mantri Awas Yojana (Urban) {PMAY (U)} - Housing For All from National Urban Housing Fund (NUHF) raised through Extra Budgetary Resource (EBR) borrowed from National Small Savings Fund (NSSF) disbursed to the States/UTs as per the sanction orders of the MoHUA	80,00,00,00,000
<b>TOTAL</b>	<b>80,16,17,82,117</b>

The Accounts have been audited by M/s A. N. Garg & Company, Chartered Accountants, the balance sheet and the statement of accounts of the year 2017-18 is placed in the report.



*A.N. Garg & Company*  
 CHARTERED ACCOUNTANTS

## INDEPENDENT AUDITOR'S REPORT

To

The Members,  
 Building Materials & Technology Promotion Council  
 NEW DELHI

### Report on the Financial Statements

We have audited the accompanying financial statements of **BUILDING MATERIALS & TECHNOLOGY PROMOTION COUNCIL** ("the SOCIETY") registered under the Societies Registration Act 1860, which comprise the Balance Sheet as at March 31, 2018 and statement of Income and Expenditure for the year ended and a summary of significant accounting policies and other explanatory information.

### Management Responsibility for the Financial Statement

Management is responsible for the preparation of these financial statements that give a true and fair view of the financial position, financial performance in accordance with the Accounting Principles generally accepted in India. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

### Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Society's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.



Contd....2.....

We believe that the audit evidences we have obtained are sufficient and appropriate to provide a basis for our unqualified audit opinion.

**Basis for Opinion:**

**Opinion**

In our opinion and to the best of our information and according to explanation given to us, the financial statements give the information required in the manner so required and give true and fair view in conformity with the accounting principles generally accepted in India:

- (a) In case of Balance Sheet, of the state of affairs of the Society as at March 31, 2018;
- (b) In case Statement of Income and Expenditure Account, of the Surplus for the year ended on that date; and
- (c) In case of Receipts and Payment Account of Receipts and Payments for the year ended on that date.

**Report on Other Legal and Regulatory Requirements:**

We report that:

- (a) We have obtained all the information and explanation, which to the best of our knowledge and belief were necessary for the purpose of our audit.
- (b) In our opinion, proper books of accounts as required by the law have been kept by the Society so far as it appears from our examination of the books.
- (c) In our opinion, the Balance Sheet & Statement of Income & Expenditure account dealt with by the report complies with the Accounting Standards issued by the Institute of Chartered Accountants of India.
- (d) The Balance Sheet and Statement of Income & Expenditure account dealt with by this Report are in agreement with the books of accounts.
- (e) The Receipts and Payment Account dealt with by this report are in agreement with the books of accounts.

**Place: DELHI**  
**Date: 11-10-2018**

FOR A N GARG & COMPANY  
Chartered Accountants  
(FRN: 004616N)



**A.N. GARG**  
**(FCA, Partner)**  
**M. No. 083687**





## Building Materials & Technology Promotion Council

Ministry of Housing & Urban Affairs, Government of India

### BALANCE SHEET AS ON 31 MARCH 2018

Amount ( ₹ )

	Schedule	2017-18	2016-17
<b><u>CORPUS/CAPITAL FUND AND LIABILITIES</u></b>			
CORPUS/CAPITAL FUND	1	1,000,000	1,000,000
RESERVES AND SURPLUS	2	181,220,677	260,659,557
LONG TERM LIABILITY	3	80,000,000,000	-
EARMARKED FUNDS	4	141,250	2,942,159
CURRENT LIABILITIES AND PROVISIONS	5	233,047,007	3,471,556
<b>TOTAL</b>		<b>80,415,408,934</b>	<b>268,073,272</b>
<b><u>ASSETS</u></b>			
FIXED ASSETS	6	31,593,607	35,264,165
NON-CURRENT ASSETS	7	80,000,000,000	-
CURRENT ASSETS, LOANS & ADVANCES ETC.	8	383,815,327	232,809,107
<b>TOTAL</b>		<b>80,415,408,934</b>	<b>268,073,272</b>
SIGNIFICANT ACCOUNTING POLICIES AND NOTES TO THE ACCOUNTS	17		

As per our report of even date attached.

For A.N.GARG & COMPANY  
Chartered Accountants

FRN: 04616N

A.N.GARG  
(FCA, Partner)  
M.No. 083687



S.B. Srinivasan

S. Balasrinivasan  
(Chief - Finance )

For Building Materials & Technology  
Promotion Council

Dr. Shailesh Kr. Agrawal

Dr. Shailesh Kr. Agrawal  
(Executive Director)

Place: New Delhi  
Date: 11.10.2018

**bmtpc** Building Materials & Technology Promotion Council  
Ministry of Housing & Urban Affairs, Government of India

**INCOME & EXPENDITURE ACCOUNT  
FOR THE YEAR ENDED 31 MARCH 2018**

		Amount ( ₹ )	
	Schedule	2017-18	2016-17
<b>INCOME</b>			
Grants / Subsidies	9	30,000,000	75,403,834
Training Programmes/Seminar Receipts	10	3,354,240	1,689,965
Income from Publications and PAC's Fee etc.	11	2,505,394	1,909,805
Interest Earned	12	11,031,932	17,183,950
<b>TOTAL (A)</b>		<b>46,891,566</b>	<b>96,187,554</b>
<b>EXPENDITURE</b>			
Expenditure on Salary, Establishment & Administration	13	67,475,253	35,747,978
Expenditure on Dissemination / Seminars/Workshops, Training Programmes, HFA, etc.	14	12,228,432	30,703,092
Expenditure on Financial Assistance, Sponsored Studies etc.	15	40,476,295	46,078,740
Depreciation	6	3,849,648	4,918,202
<b>TOTAL (B)</b>		<b>124,029,628</b>	<b>117,448,012</b>
Excess of Expenditure over Income (A-B)		(77,138,062)	(21,260,458)
Prior Period Items		2,300,818	-
<b>BALANCE BEING DEFICIT CARRIED TO BALANCE SHEET</b>		<b>(79,438,880)</b>	<b>(21,260,458)</b>

As per our report of even date attached.

For A.N.GARG & COMPANY  
Chartered Accountants  
FRN: 04616N

A.N.GARG  
(FCA, Partner)  
M.No.083687



S.B. Srinivasan

S. Balasrinivasan  
(Chief - Finance )

For Building Materials & Technology  
Promotion Council

Dr. Shailesh Kr. Agrawal

Dr. Shailesh Kr. Agrawal  
(Executive Director)

Place: New Delhi  
Date: 11.10.2018



**Building Materials & Technology Promotion Council**  
Ministry of Housing & Urban Affairs, Government of India

**RECEIPTS & PAYMENT ACCOUNT  
FOR THE YEAR ENDED 31 MARCH 2018**

	Amount ( ₹ )	
	2017-18	2016-17
<b>RECEIPTS</b>		
<b>1 Opening Balance</b>		
Cash Balances in hand	8,217	58,289
Bank Balances		
With Scheduled Banks:		
- Deposit with Canara Bank	187,200,000	127,383,062
- On Savings Accounts:		
- Canara Bank	10,213,390	113,850,456
- State Bank Of India	4,568,089	6,508,108
	201,981,479	247,741,626
<b>2 Grants-in-aid from Central Government (Ministry of Housing &amp; Urban Affairs)</b>	30,000,000	50,000,000
<b>3 Receipts towards Fees/DRMC/Training Programme &amp; seminar receipts</b>	5,972,910	2,069,965
<b>4 Loan &amp; Advances(Net)</b>	2,571,616	-
<b>5 Security Deposit etc</b>	4,253,680	2,037,264
<b>6 Amount received from National Small Savings Fund</b>	80,000,000.000	-
<b>7 Interest received on NUHF Fund payable to MoHUA</b>	52,602,740	-
<b>8 Receipts from NHB towards Demonstration Housing Project at Odisha</b>	18,594,000	7,040,000
<b>9 Income from Publications etc.</b>	2,423,794	1,909,805
<b>10 Interest Earned</b>	17,471,261	15,025,306
<b>TOTAL</b>	<b>80,335,879,697</b>	<b>325,882,255</b>
<b>PAYMENTS</b>		
<b>1 Purchase of Fixed Assets</b>	179,090	1,575,311
<b>2 Expenditure on Salary, Establishment &amp; Administration</b>	64,235,397	35,368,164
<b>3 Expenditure on Training Programmes, Seminars/DRMC/Workshops, etc.</b>	13,378,841	30,703,092
<b>4 Expenditure on Financial Assistance, Sponsored Studies, HFA etc.</b>	40,476,295	118,269,623
	-	46,090,886
<b>5 Loan &amp; advances(Net)</b>	-	3,999,687
<b>6 Security Deposit etc</b>	46,585	395,000
<b>7 Earmarked funds</b>		
National Urban Housing Fund	80,000,000.000	-
Rejuvenation and strengthening of Building Centers	612,325	30,000
Demonstration Housing Project in various states	40,217,584	4,851,416
Data Resource Monitoring Cell	2,636,000	-
BIPARD	-	20,253
UNDP-Developing Toolkit for Urban Managers	80,043,465,909	858,750
	-	5,760,419
<b>8 Closing Balance</b>		
Cash Balances in hand	-	8,217
Bank Balances		
With Scheduled Banks:		
- Deposit with Canara Bank	108,719,043	187,200,000
- On Savings Accounts:		
- Canara Bank	9,578,823	10,213,390
- State Bank Of India	3,196,974	-
- State Bank Of India(NUHF)	52602740	174,097,580
	174,097,580	4,568,089
	<b>80,335,879,697</b>	<b>325,882,255</b>

As per our report of even date attached

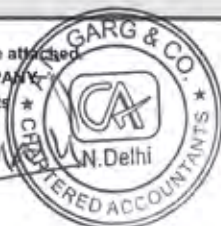
For A.N.GARG & COMPANY

Chartered Accountants

FRN: 04616N

*(Signature)*

A.N.GARG  
(FCA, Partner)  
M.No.083687



For Building Materials & Technology  
Promotion Council

*(Signature)*

S. Balasrinivasan  
(Chief - Finance)

*(Signature)*

Dr. Shailesh Kr. Agrawal  
Executive Director

Place: New Delhi  
Date: 11.10.2018



**Building Materials & Technology Promotion Council**

Ministry of Housing & Urban Affairs, Government of India

**SCHEDULES FORMING PART OF BALANCE SHEET AS ON 31 MARCH 2018**

	Amount ( ₹ )	
	2017-18	2016-17
<b>SCHEDULE 1- CORPUS/CAPITAL FUND</b>		
Balance as at the beginning of the year	1,000,000	1,000,000
<b>TOTAL</b>	<b>1,000,000</b>	<b>1,000,000</b>
<b>SCHEDULE 2- RESERVES AND SURPLUS</b>		
<b>1. Capital Reserve</b>		
Opening Balance	89,925,759	88,350,448
Addition during the year	179,090	1,575,311
<b>2. Excess of Income over Expenditure</b>		
Opening Balance	170,733,798	193,569,567
Less : Amount transferred from Income & Expenditure A/c	(79,438,880)	(21,260,458)
	91,294,918	172,309,109
Less transferred to Capital Reserve	179,090	1,575,311
<b>TOTAL</b>	<b>181,220,677</b>	<b>260,659,557</b>
<b>SCHEDULE 3- LONG TERM LIABILITY</b>		
<b>National Urban Housing Fund</b>		
Loan from National Small Savings Fund for disbursement as Central Assistance to States/UTs under PMAY(U) Mission	80,000,000,000	-
<b>TOTAL</b>	<b>80,000,000,000</b>	<b>-</b>
<b>SCHEDULE 4- EARMARKED FUNDS</b>		
<b>1 UNDP-Developing Toolkit for Urban Managers</b>		
Opening Balance	141,250	500,000
Received during the year	-	500,000
Less : Utilisation/Expenditure during the year	-	858,750
	141,250	141,250
<b>2 Demonstration Housing Project at Odisha</b>		
Opening Balance	2,188,584	-
Recoverable during the year	7,040,000	7,040,000
Less : Utilisation/Expenditure during the year	9,228,584	4,851,416
	-	2,188,584
<b>3 Rejuvenation and strengthening of Building Centers</b>		
Opening Balance	612,325	642,325
Less : Utilisation/Expenditure during the year	612,325	30,000
	-	612,325
<b>4 National Urban Housing Fund</b>		
Received during the year	80,000,000,000	-
Less : Disbursement during the year( schedule 16)	80,000,000,000	-
	-	-
<b>5 Data Resource Monitoring Cell</b>		
Received during the year	2,636,000	-
Less : Utilisation/Expenditure during the year	2,636,000	-
	-	-
<b>6 Demonstration Housing Project at Patna,Biharsharf</b>		
Received during the year	8,945,000	-
Recoverable during the year	5,963,000	-
Less : Utilisation/Expenditure during the year	14,908,000	-
	-	-
<b>7 Demonstration Housing Project at Lucknow</b>		
Received during the year	9,649,000	-
Recoverable during the year	6,432,000	-
Less : Utilisation/Expenditure during the year	16,081,000	-
	-	-
<b>TOTAL</b>	<b>141,250</b>	<b>2,942,159</b>
<b>SCHEDULE 5- CURRENT LIABILITIES AND PROVISIONS</b>		
<b>CURRENT LIABILITIES</b>		
- Outstanding Liabilities	5,196,280	806,015
- Security Deposit	6,919,221	2,665,541
- Interest Payable to NUHF	220,931,506	-
<b>TOTAL</b>	<b>233,047,007</b>	<b>3,471,556</b>





**Building Materials & Technology Promotion Council**  
Ministry of Housing & Urban Affairs, Government of India

**SCHEDULES FORMING PART OF BALANCE SHEET AS ON 31 MARCH 2018**

Amount ( ₹ )

SCHEDULE 6- FIXED ASSETS	GROSS BLOCK			DEPRECIATION			2017-18	2016-17
	Cost as at 01.4.17	Additions	Total	Upto 01.04.17	Current year	Upto 31.03.18	NET BLOCK	NET BLOCK
							As at 31.03.18	As at 31.03.17
Land	749,317	-	749,317	-	-	-	749,317	749,317
Office Building	33,570,500	-	33,570,500	3,357,050	3,021,345	6,378,395	27,192,105	30,213,450
Furniture and Fixtures	3,662,007	-	3,662,007	2,844,588	81,742	2,926,330	735,677	817,419
Office Equipments	19,590,614	21,190	19,611,804	17,936,771	250,318	18,187,089	1,424,715	1,653,843
Computers/ Peripherals	18,771,576	157,900	18,929,476	18,011,004	335,809	18,346,813	582,663	760,572
Air conditioners	1,035,166	-	1,035,166	748,175	43,049	791,224	243,942	286,991
Fan & Coolers	81,224	-	81,224	55,553	3,851	59,404	21,820	25,671
TV and VCR	380,450	-	380,450	332,249	7,229	339,478	40,972	48,201
Exhibits, Panels, Display Models	12,084,905	-	12,084,905	11,376,204	106,305	11,482,509	602,396	708,701
	<b>89,925,759</b>	<b>179,090</b>	<b>90,104,849</b>	<b>54,661,594</b>	<b>3,849,648</b>	<b>58,511,242</b>	<b>31,593,607</b>	<b>35,264,165</b>
Previous Year (2016-17)	88,350,448	1,575,311	89,925,759	49,743,392	4,918,202	54,661,594	35,264,165	38,607,056





**Building Materials & Technology Promotion Council**  
Ministry of Housing & Urban Affairs, Government of India

**SCHEDULES FORMING PART OF BALANCE SHEET AS ON 31 MARCH 2018**

Amount ( ₹ )

SCHEDULE 7- NON CURRENT ASSETS	2017-18	2016-17
1.Amount Recoverable from MoHUA for repayment of loan taken from NSSF for National Urban Housing Fund under PMAY(U) Mission	80,000,000,000	-
<b>TOTAL</b>	<b>80,000,000,000</b>	<b>-</b>

SCHEDULE 8 - CURRENT ASSETS, LOANS, ADVANCES ETC.	2017-18	2016-17
---	---------	---------

**A. CURRENT ASSETS:**

1. Cash in hand	-	8,217
2. Bank Balances		
- Deposit with Canara Bank	108,719,043	187,200,000
- On Savings Accounts:		
- Canara Bank	9,578,823	10,213,390
- State Bank of India	3,196,974	4,568,089
- State Bank of India(NUHF)	52,602,740	174,097,580
	<u>174,097,580</u>	<u>201,981,479</u>

**B. LOANS, ADVANCES AND OTHER ASSETS**

1. Advances to staff	1,790,963	1,790,963	4,735,966	4,735,966
2. Amount Recoverable from MoHUA under NUHF- Central Assistance from EBR under PMAY(U)	168,328,766	168,328,766		
3. Advances and other amounts recoverable in cash or in kind or value to be received				
a.Amount Recoverable & other Advances	23,456,376		6,038,760	
b.Security Deposit (Space)	466,585		420,000	
c.Tax Deducted at Source & GST Recoverable	11,136,807	35,059,768	8,639,914	15,098,674
3. Interest Accured on FDR's		4,538,250		10,984,771
		<u>4,538,250</u>	<u>8,639,914</u>	<u>15,098,674</u>

**TOTAL (A + B)**

**383,815,327**

**232,809,107**





## Building Materials & Technology Promotion Council

Ministry of Housing & Urban Affairs, Government of India

### SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED AS ON 31 MARCH 2018

Amount ( ₹ )

	2017-18	2016-17
<b>SCHEDULE 9- GRANTS/SUBSIDIES (Irrevocable Grants &amp; Subsidies Received)</b>		
1 Central Government (Ministry of Housing & Urban Affairs, Government of India)	30,000,000	50,000,000
Add: Unutilised Grants Brought Forwarded from Financial Year 2015-16	-	25,403,834
<b>TOTAL</b>	<b>30,000,000</b>	<b>75,403,834</b>
<b>SCHEDULE 10 - FEES/SUBSCRIPTIONS</b>	<b>2017-18</b>	<b>2016-17</b>
1 Training Programmes/Seminar Receipts	3,354,240	1,689,965
<b>TOTAL</b>	<b>3,354,240</b>	<b>1,689,965</b>
<b>SCHEDULE 11- INCOME FROM PACS FEE, PUBLICATION ETC.</b>	<b>2017-18</b>	<b>2016-17</b>
1 Receipts towards sale of publications, PACS etc	2,505,394	1,909,805
<b>TOTAL</b>	<b>2,505,394</b>	<b>1,909,805</b>
<b>SCHEDULE 12- INTEREST EARNED</b>	<b>2017-18</b>	<b>2016-17</b>
1 On Term Deposits With Scheduled Banks	10,223,162	13,889,687
2 On savings Accounts With Scheduled Banks	523,461	2,910,174
3 On Advance to employees	285,309	384,089
<b>TOTAL</b>	<b>11,031,932</b>	<b>17,183,950</b>
<b>SCHEDULE 13- EXPENDITURE ON SALARY, ESTABLISHMENT &amp; ADMINISTRATION</b>	<b>2017-18</b>	<b>2016-17</b>
1 Pay and Allowances	57,700,258	27,321,861
2 Leave Travel Concession	326,312	400,325
3 Reimbursement of Medical Expenses	968,027	1,313,194
4 Honorarium	332,500	351,500
5 Administration Expenses	8,148,156	6,361,098
<b>TOTAL</b>	<b>67,475,253</b>	<b>35,747,978</b>
<b>SCHEDULE 14 - EXPENDITURE ON DISSEMINATION / SEMINARS/WORKSHOPS, TRAINING PROGRAMMES, HFA, ETC.</b>	<b>2017-18</b>	<b>2016-17</b>
1 Exhibition and publicity	1,535,190	2,255,858
2 Seminar and Conference Expenses	1,128,326	1,174,313
3 Printing, Publication & Advertisement	1,988,243	2,136,082
4 Books and Periodicals	74,417	60,157
5 Supervision and Monitoring of Demonstration Housing Project in various parts of India	666,619	3,461,249
6 Housing for All (Handholding, documentation, sensitization & Capacity Building)	4,062,961	11,520,693
7 Disaster Mitigation Management	390,971	-
8 S&T support to various schemes of ministry i.e 10% NE, NULM	-	1,684,352
9 Technology Submission	1,190,854	3,024,406
10 Main stream Emerging Technologies through Dissemination, Transfer and Exchange with State Government	1,190,851	5,385,982
<b>TOTAL</b>	<b>12,228,432</b>	<b>30,703,092</b>



**bmtpc** Building Materials & Technology Promotion Council  
Ministry of Housing & Urban Affairs, Government of India

**SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT  
FOR THE YEAR ENDED AS ON MARCH 2018**

SCHEDULE 15 - EXPENDITURE ON SPONSORED STUDIES, FINANCIAL ASSISTANCE, ETC.	Amount ( ₹ )	
	2017-18	2016-17
<b>A Building Materials &amp; Construction Technologies</b>		
1 Development of commercial process for utilisation of pond ash in manufacture of cold setting building brick and block	60,000	881,475
2 Assessment of statewise total brick requirement and number of clay brick being manufactured in India	24,680	541,266
3 Construction of demonstration houses at Lucknow	1,484,705	2,598,829
4 Demonstration of bamboo based technology in New Delhi	10,400	176,208
5 Construction of demonstration houses at Bhubaneswar	4,234,320	1,478,591
6 Construction of demonstration houses and community centre at Nellore	2,111,004	25,483,476
7 Estimation of embodied energy for low carbon building construction	169,200	169,200
8 Performance appraisal certification scheme	981,349	644,319
9 Development of knowledge network portal for sustainable habitat in India	408,250	815,911
10 Construction of demonstration houses at Telangana, Hyderabad	22,246,254	1,815,661
11 Construction of demonstration houses at Bihar Sharif	2,303,617	1,965,549
12 HUMotor: A Human way to utilize the human efforts at workplace	27,196	480,000
13 Testing & validation of multi attributes evaluation framework for emerging technologies for housing	522,200	-
14 Development of fly ash based advanced Ligno-Silico-Aluminious Geopolymeric Binder useful for making cement free green concrete	200,000	-
15 Soil investigation & preparation of detailed survey plan for DHP at Guwahati, Assam	124,806	-
16 GFRG structures using building information models	-	16,070
17 Preparation of compendium of green technology for different geo climate zones for three states Delhi, Punjab & Haryana including Noida & Greater Noida	-	368,000
18 construction of dwelling units with innovative sustainable and economical technology in situ casting with light weight cellular concrete	-	492,850
19 Development of work specification and analysis of rates for GFRG	-	187,500
20 Documentation of housing project involving new construction technologies in the state of Delhi-NCR, Maharashtra, Karnataka and West Bengal	-	287,500
21 Guidelines of utilisation of C&D waste in construction of dwelling units & related infrastructure in housing scheme of Govt.	-	965,663
22 Regional workshop under PMAY HFA at Vishakhapatnam	-	10,501
23 Regional workshop under PMAY HFA at Agartala, Tripura and Training Programme for Masons, Beneficiaries and Engineers of Tripura on disaster resistant construction under BLC of PMAY	-	457,178
24 International Seminar on emerging building material & construction technologies	-	190,954
25 Development of concrete columns for low cost housing	-	250,000
26 Structural stability assessment and development of guidelines for expanded polystyrene core panel system	-	200,000
27 Durability of assessment & enhancement of service life of expanded polystyrene core panel system	-	150,000
28 Development of discarded fishnet reinforced hybrid sheet for indoor partition	-	358,911
29 Seismic Performance studies on bamboo structure in North East	-	100,000
30 Workshop on utilisation of construction & demolition c&d waste in construction of dwelling units & related infrastructure	-	312,642
<b>Sub-Total (A)</b>	<b>34,907,981</b>	<b>41,398,254</b>







## Building Materials & Technology Promotion Council

Ministry of Housing & Urban Affairs Government of India

### SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED AS ON 31 MARCH 2018

Amount (₹)

SCHEDULE 15 - EXPENDITURE ON SPONSORED STUDIES, FINANCIAL ASSISTANCE, ETC.		2017-18	2016-17
<b>B Capacity Building &amp; Skill Development</b>			
1	Training Programme on bamboo based toilet construction at Kaziranga, Assam	100,000	700,000
2	Capacity building programmes on good construction practices including emerging technologies at Kerala	217,208	-
3	Film on EPS Based panel system	103,500	-
4	Hosting of knowledge web portal at BMTPC	117,014	-
5	Training Programme for fly ash brick manufacturers and potential Entrepreneurs at Delhi-NCR & Cuttack, Odisha	272,500	-
6	Developing of mobile application on construction of bamboo based technology for housing	400,000	-
7	Developing of curriculum on sustainable building technology for engineering and architecture education	316,500	-
8	National seminar on Emerging Building Materials Construction Technology at New Delhi	1,659,170	-
9	National consultation on Housing for All under PMAY	1,063,261	-
10	Production of short films on Emerging Housing Technologies	360,000	-
11	National workshop on use of construction & demolition waste in housing technologies	100,000	-
12	Development of basic audio visual training modules	-	491,832
13	Development of online courses on emerging technologies under subject "catalyzing the market for affordable housing at IIT Kharagpur	-	373,750
14	Development of online courses on emerging technologies under subject "catalyzing the market for affordable housing at IIT-Roorkee"	-	498,525
15	Consultation on shallow masonry domes alternative traditions in roofing system	-	173,421
16	Capacity Building Programme on Good Construction Practices including Emerging Technologies for Housing, Dehradun, Uttarakhand	-	214,697
17	Capacity Building Programme on Good Construction Practices including Emerging Technologies for Housing, Gandhi Nagar, Gujarat	-	134,149
18	Capacity Building Programme on Good Construction Practices including Emerging Technologies for Housing organised at Portblair, Andaman & Nicobar Islands	-	347,039
19	Capacity Building Programme on Good Construction Practices for Construction of Housing under BLC of PMAY at Bihar Shariff for beneficiaries, masons & engineers for BLC	-	41,735
20	Workshop & Training Programme on bamboo based technology and toilet construction at Itanagar	-	100,000
21	Workshop & Training Programme on bamboo based technology and toilet construction at Imphal, Manipur	-	100,000
Sub-Total (B)		<b>4,709,153</b>	<b>3,175,148</b>



		Amount (₹)	
SCHEDULE 15 - EXPENDITURE ON SPONSORED STUDIES, FINANCIAL ASSISTANCE, ETC.		2017-18	2016-17
<b>C</b>	<b>Disaster Mitigation &amp; Management</b>		
1	Design,development & implementation of mobile application for earthquake hazard zoning maps of india	381,578	211,863
2	Preparation of Disaster management plan	422,500	162,500
3	Preparation of revised vulnerability Atlas of India	19,985	-
4	Technical workshop for Engineers in Aizwal to develop capacity in Earthquake Resistant Construction	35,098	400,000
5	Training Programme on seismic design of multi storey building : IS 1893 vs Eurocode 8	-	730,975
Sub-Total (C)		<b>859,161</b>	<b>1,505,338</b>
<b>TOTAL (A+B+C)</b>		<b>40,476,295</b>	<b>46,078,740</b>





**Building Materials & Technology Promotion Council**  
Ministry of Housing & Urban Affairs Government of India

**SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT  
FOR THE YEAR ENDED AS ON 31 MARCH 2018**

		Amount (₹)	
SCHEDULE 16 - NUHF-Central Assistance from EBR under PMAY (U)		2017-18	2016-17
1	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Andaman & Nicobar for 1 BLC Project	2,280,000	-
2	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Andhra Pradesh for 26 AHP Project	4,060,073,000	-
3	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Andhra Pradesh for 35 BLC Project	1,298,640,000	-
4	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Arunachal Pradesh for 17 BLC Project	95,580,000	-
5	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Arunachal Pradesh for 6 BLC Project	108,660,000	-
6	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Assam for 50 BLC Project	806,760,000	-
7	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Assam for 66 BLC Project	820,680,000	-
8	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Bihar for 17 BLC Project	292,200,000	-
9	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Bihar for 46 BLC Project	1,520,640,000	-
10	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Chhattisgarh for 19 AHP Project	1,047,420,000	-
11	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Chhattisgarh for 349 BLC Project	3,056,340,000	-
12	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Dadra & Nagar Haveli for 1 AHP Project	111,360,000	-
13	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Daman & Diu for 2 AHP Project	17,940,000	-
14	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Gujarat for 2 AHP Project	85,512,730	-
15	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Gujarat for 20 BLC Project	651,300,000	-
16	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Gujarat for 5 AHP Project	374,760,000	-
17	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Gujarat for 6 AHP Project	526,620,000	-
18	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Gujarat for 6 ISSR Project	42,760,000	-
19	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Haryana for 93 BLC Project	1,081,200,000	-
20	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for HUDCO NSSF for CLSS Schemes	350,000,000	-
21	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Jammu & Kashmir for 84 BLC Project	483,829,300	-
22	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Jharkhand for 36 BLC Project	661,440,000	-



SCHEDULE 16 - NUHF-Central Assistance from EBR under PMAY (U)		Amount (₹)	
		2017-18	2016-17
23	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Jharkhand for 7 AHP Project	1,609,955,000	-
24	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Jharkhand for 17 AHP Project	2,026,970	-
25	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 220 BLC Project	1,524,780,000	-
26	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 119 BLC Project	146,760,000	-
27	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 234 BLC Project	937,260,000	-
28	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 3AHP Project	70,620,000	-
29	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 51BLC Project	131,220,000	-
30	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 76 BLC Project	53,520,000	-
31	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 10 AHP Project	6,594,240,000	-
32	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 12 AHP Project	961,560,000	-
33	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Karnataka for 110 AHP Project	2,897,928,000	-
34	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Kerala for 52 BLC Project	162,420,000	-
35	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Kerala for 49 BLC Project	343,140,000	-
36	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Kerala for 75 BLC Project	833,820,000	-
37	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Madhy Pradesh for 56 BLC Project	1,325,940,000	-
38	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Madhya Pradesh for 1 AHP Project	123,388,000	-
39	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Madhya Pradesh for 133 BLC Project	2,500,440,000	-
40	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Madhya Pradesh for 15 AHP Project	884,580,000	-
41	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Madhya Pradesh for 340 BLC Project	8,144,400,000	-
42	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Madhya Pradesh for 4 AHP Project	1,715,040,000	-
43	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Mizoram for 6 BLC Project	425,400,000	-
44	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Mizoram for 7 BLC Project	149,400,000	-
45	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Nagaland for 2 BLC Project	11,700,000	-
46	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the National Housing Bank (NHB) (CLSS for EWS/LIG)	6,000,000,000	-
47	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Odisha for 27 BLC Project	156,300,000	-



SCHEDULE 16 - NUHF-Central Assistance from EBR under PMAY (U)		Amount (₹)	
		2017-18	2016-17
48	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Odisha for 88 BLC Project	1,031,700,000	-
49	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Puducherry for 3 BLC Project	77,220,000	-
50	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Puducherry for 4 BLC Project	90,660,000	-
51	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Punjab for 117 BLC Project	637,453,000	-
52	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Rajasthan for 06 AHP Project	332,160,000	-
53	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Rajasthan for 9 AHP Project	318,846,000	-
54	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Sikkim for 2 BLC Project	9,600,000	-
55	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Tamil Nadu for 34 AHP Project	837,060,000	-
56	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Tamil Nadu for 50 BLC Project	1,090,980,000	-
57	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Tamil Nadu for 6 AHP Project	53,700,000	-
58	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Tamil Nadu for 8 AHP Project	228,780,000	-
59	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Telangana for 100 AHP Project	4,719,960,000	-
60	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Telangana for 73 AHP Project	603,703,000	-
61	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Tripura for 20 BLC Project	174,700,000	-
62	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Tripura for 20 BLC Project	163,181,000	-
63	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttar Pradesh for 06 AHP Project	273,120,000	-
64	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttar Pradesh for 20 AHP Project	1,113,622,000	-
65	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttar Pradesh for 44 BLC Project	547,920,000	-
66	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttar Pradesh for 644 BLC Project	10,565,798,000	-
67	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttarakhand for 10 BLC Project	58,380,000	-
68	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttarakhand for 2 AHP Project	144,000,000	-
69	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of Uttarakhand for 75 BLC Project	423,660,000	-
70	Central Assistance under Pradhan Mantri Awas Yojna (PMAY) (URBAN)-Housing for All Mission for the Government of West Bengal for 70 BLC Project	1,301,964,000	-
<b>Sub-Total</b>		<b>80,000,000,000</b>	<b>-</b>





**SCHEDULE 17: SIGNIFICANT ACCOUNTING POLICIES AND NOTES TO THE ACCOUNTS**

**1 Significant Accounting Policies**

- a) **System of Accounting:** The accounts have been prepared to comply with all material aspects with applicable principals in India and notified Accounting Standards.
- b) **Fixed Assets:** Fixed assets are stated at cost of acquisition less accumulated depreciation provided as per income tax act 1961. All the fixed assets are recognized as per the rules and regulations as provided in the General Financial Rules, 1963, amended upto date.
- c) **Depreciation:** Depreciation is provided at written down values rates and in the manner as specified in the Income Tax Act 1961.
- d) **Government Grants:**
  - (i) Government Grants received during the year are accounted in accordance with Accounting Standard 12 on 'Accounting for Government Grants' issued by ICAI.
  - (ii) Earmarked funds received for specific purpose are utilized for the purpose for which funds are received and the unspent balance of such funds are carried forward until fully utilized or refunded.
- e) **Retirement Benefits-**
  - (i) The Council contributes to its own Provident Fund Trust which is recognized by the Income Tax authorities and the contributions paid during the year to Provident Fund Trust are charged to revenue.
  - (ii) Liability in respect of Gratuity and Leave Encashment to employees is provided by way of premium paid to LIC and is charges to revenue in the year of payment.
- f) **Income and Expenditure:** Since there are large number of income and expenditure accounting heads, expenses and revenue of similar nature and falling under different Heads are clubbed together wherever required for better presentation of financial statements.
- g) The prior period expenditure amounting to Rs.23,00,818/- was sanctioned during FY 2017-18, this expenditure relates to prior period and same has been reflected in the Income & Expenditure Account in FY 2017-18 separately.
- h) **General:** Accounting policies not specifically mentioned are otherwise in consonance with generally accepted accounting practices.

**2 Contingent Liabilities:** Claims against the Council not acknowledged as debts - NIL.

**3** In opinion of the Management, the amount on realization of current assets, loans and advances in the ordinary course of business would not be less than the amount at which they are stated in the Balance Sheet. Further, provision for all known liabilities has been made in the accounts.

**4** As there is no taxable income under the Income Tax Act, 1961, provision for Income Tax has not been made in the accounts. The Council is regularly depositing TDS, GST and other statutory liabilities.

**5 a)** Ministry of Housing & Urban Affairs vide letter no. N-11022/1/2018-HFA-III-UD (C. No. 9035628) dated 14.03.2018 conveyed to BMTPC the following:

The Cabinet in its meeting held on 20.02.2018 has approved, inter-alia, the proposal of our Ministry as under:

- Raising of funds through Extra Budgetary Resources (EBR) to the extent of Rs. 60,000 crore through a lending agency or financial institution, over four years, for PMAY (Urban) projects, in consultation with the Ministry of Finance;
- BMTPC to take loan on behalf of Government of India and disburse to the States / UTs and Central Nodal Agencies (CNAs), on the advice of the Ministry of Housing and Urban Affairs, for PMAY (Urban);
- Government of India will amortize the loan and fulfil the repayment obligations at the agreed upon terms and conditions as decided by the Ministry of Finance.

**b)** Ministry of Finance vide its letter no. 5/5/2016-NS dated 15.03.2018 conveys the sanction of the President to invest Rs. 8000 Crore (Rupees Eight Thousand Crore) from the resources of National Small Savings Fund (NSSF) in BMTPC, for a period of ten years, which is to be repaid in Bullet Payment at the time of maturity of loan i.e. after completion of ten years and the interest will be paid half yearly @ 8.4% p.a.

**c)** As per Para III of the Minutes of 1st meeting held on 04.07.2018 of the Monitoring Committee on National Urban Housing Fund (NUHF) under Pradhan Mantri Awas Yojana (Urban) constituted by Ministry of Housing and Urban Affairs vide its letter no. N-11022/1/2018-HFA-III-UD (C.No. 9035628) dated 21.05.2018, it is that stated that "The HFA Directorate should take appropriate and timely action for repayment of interest as per the schedule of repayment of the loan; and Ministry of Finance may be pursued to get the MoA signed in respect of NSSF loan obtained by BMTPC."

**d)** In view of the above, the amount of principal and interest is to be met out of the funds allocated by the Ministry of Housing & Urban Affairs and there is the virtual certainty of the amount, the expected amount recoverable is shown as a separate asset i.e. Non-Current Asset and the loan sanctioned by NSSF is shown as Long-Term Liability Asset in the Balance Sheet.

**6** Figures have been rearranged & regrouped wherever required and all the above said information has been given by the management and relied upon by the auditors.

**7** Schedule 1 to 17 annexed to and form integral part of financial statements for the year ended 31.03.2018.

As per our report of even date attached  
For **A.N.GARG & COMPANY**  
Chartered Accountants  
FRN: 04616N  
  
A.N.GARG  
(FCA, Partner)  
M.No.083667



For Building Materials & Technology  
Promotion Council

  
S. Balasrinivasan  
Chief (Finance)

  
Dr. Shailesh Kr. Agrawal  
(Executive Director)

Place: New Delhi  
Date: 11.10.2018

**PARTICIPATION IN NATIONAL AND INTERNATIONAL EVENTS****I. EXHIBITIONS**

During the year, the Council actively participated in various exhibitions which have helped in sharing knowledge and experience in cost effective & emerging, environment friendly and energy efficient building materials, construction technologies and simple machines for production of building components including emerging technologies:

- Municipalika 2017, 14<sup>th</sup> International Conference & Exhibition on Smart and Sustainable City Solutions from 18-20 May, 2017, Navi Mumbai, Maharashtra
- Indian National Exhibition-cum-Fair 2017 organised by Bengal Human Resource Development Foundation during 17 to 20 August 2017 at Kolkata
- India International Trade Fair from 14-27 November, 2017 at Pragati Maidan, New Delhi
- Exhibitions of Prize Winning Paintings of Differently Abled Children on the theme “Housing Policies: Affordable Homes” during World Habitat Day 2017 celebration on 5<sup>th</sup> October, 2017 at New Delhi
- Exhibition on Emerging Building Materials and Construction Technologies showcasing various building products and construction technologies during National Seminar organized by BMTPC on February 22-23, 2018 at New Delhi
- Exhibition on “Vision Jammu & Kashmir 2018” at Udhampur, J&K during 29<sup>th</sup> – 31<sup>st</sup> January 2018

**II. SEMINARS/ CONFERENCES/ WORKHOPS/TRAINING PROGRAMMES etc.**

- Sensitization Programme on Emerging Technologies at Demonstration Housing Project site organized by BMTPC on May 15, 2017 at Bhubaneswar
- Awareness Workshop on “Prefab Housing Construction Technologies” organized by Hindustan Prefab Limited, New Delhi held on May 12, 2017 at Dehradun, Uttarakhand.
- Workshop on Performance Evaluation of Housing Units organized jointly with IIT Kanpur on 21-22 July, 2017 at Noida

- National Student Design Competition on Housing for All organised by Department of Architecture & Planning, IIT Roorkee during 22-23 July, 2017
- Sensitization Programme on “Good Construction Practices and Emerging Technologies for Mass Housing” organized by BMTPC at Thiruvananthapuram, Kerala on August 3, 2017
- Workshop on “Management of Construction & Demolition Waste” organized by BMTPC on November 08, 2017 at Hyderabad jointly with Greater Hyderabad Municipal Corporation
- National Workshop on “Processing and Use of Construction & Demolition Waste” with theme ‘Deconstruction & in-situ processing for Ecology and Economics’ organised by BMTPC on November 21, 2017 at New Delhi
- National Consultation on ‘Accelerated Urban Missions: PMAY (U) & SBM (U)’ on 24.11.2017 at New Delhi.
- Rajbhasha Sangoshthi on “Hindi Bhasha ke badate charan” organized by BMTPC on December 11, 2017 at New Delhi
- International workshop on Global Housing Technology Challenge (GHCTC) chaired by Hon’ble Minister of State (Independent Charges) for Housing and Urban Affairs, Govt. of India during 4th-5th January, 2018 at HPL, New Delhi.
- Hands on Training for Fly Ash Brick Manufacturers organized by BMTPC at Cuttack, Odisha on January 30, 2018
- Panelist for Technology panel as part of Agenda “Value Proposition for Green Affordable housing –Scaling up the delivery of PMAY: Housing for All” organized by International Finance Corporation, World Bank Group at New Delhi on February 20, 2018
- National Seminar on Emerging Building Materials & Construction Technologies organized by BMTPC on February 22-23, 2018 at New Delhi
- Hands on Training for Fly Ash Brick Manufacturers organized by BMTPC at Jhajjar, Haryana on February 26, 2018
- International Training Programme organized by Human Settlement Management institute (HSMI), on “Formal Solutions to Informal Settlements”. Participants from 12 countries attended the programme to share knowledge and experience on providing formal solutions for inclusive growth and development of the cities.



---

### III. TECHNICAL COMMITTEE/ WORKING GROUPS /MEETINGS ETC.

- Meeting on C&D Waste Management chaired by Joint Secretary (HFA), Ministry of Housing & Urban Affairs (MoHUA) on April 5, 2017 at New Delhi
- Meeting on the issue of construction of PMAY (U) houses using New Alternate Technologies in different States chaired by Secretary, MoHUA on April 10-11, 2017 at New Delhi.
- Preparatory meeting to National Platform on Disaster Risk Reduction (NPDRR) a Consultative Workshop during April 12-13, 2017 at New Delhi.
- Hindi Karyakarini Samiti meeting organized by MoHUA on April 18, 2017 at New Delhi.
- Meeting on Technology Park & Demonstration Housing Projects on April 19, 2017 at New Delhi.
- Meeting with Expert Group on Mass Housing project on April 21, at CSIR Head Quarter, New Delhi.
- 21<sup>st</sup> meeting of CSMC under PMAY(U) on April 24, 2017 at New Delhi.
- Meeting with American Concrete Institute (ACI) regarding EPS Filer Bites and visit to Sismo Plant on May 19, 2017
- 1<sup>st</sup> meeting of GTWG-Sustainable Habitat Sector on May 29, 2017 at TIFAC, New Delhi.
- 22<sup>nd</sup> meeting of CSMC of PMAY(U) under the Chairmanship of Secretary, MoHUA on May 29, 2017 at New Delhi.
- 12<sup>th</sup> meeting of the Technical Assessment Committee (TAC) of PACS held on June 16, 2017 at New Delhi.
- 51<sup>st</sup> meeting of the Executive Committee of BMTPC held under the Chairmanship of Secretary, MoHUA on June 22, 2017 at New Delhi.
- Review meeting on Technology Sub-Mission under PMAY(U) projects on June 8, 2017 at Chennai.
- Parliamentary Standing Committee on Urban Development meeting held on June 9, 2017 at Kocchi.
- Meeting with representative of M/s Tata Steel, Jamshedpur regarding emerging technologies on June 14, 2017 at New Delhi.

- Meeting with JW Marriot Panelist during Ultra Tech Conclave on June 15, 2017.
- 23<sup>rd</sup> meeting of CSMC of PMAY(U) under the Chairmanship of Secretary, MoHUA on June 21, 2017 at New Delhi.
- Hindi Karyashala meeting organized by BMTPC held on June 30, 2017 at New Delhi.
- GTWG TIFAC meeting held on 05.07.2017 at New Delhi.
- Meeting on Global Housing Technology Challenge Chaired by Joint Secretary (HFA) on July 06, 2017 at New Delhi.
- 84<sup>th</sup> meeting of the Board of Governors of CIDC on 08<sup>th</sup> July, 2017 at New Delhi.
- 24<sup>th</sup> meeting of CSMC of PMAY(U) under the Chairmanship of Secretary, MoHUA on July 24, 2017 at New Delhi.
- Meeting chaired by Secretary (H&UA) regarding Presentation on Technology Sub-Mission (TSM) on 04.08.2017 at New Delhi.
- Meeting chaired by JS & MD (HFA) on finalization of framework regarding Roadmap for conducting workshop on Technology Challenge for Housing on August 7, 2017 at New Delhi.
- Meeting on Technology Sub-Mission (TSM) chaired by Secretary, MoHUA on August 9, 2017 at New Delhi.
- Meeting of Defence Personnel and Railway officials regarding emerging technologies in housing chaired by Secretary (HUA) on August 10, 2017 at New Delhi.
- Meeting on finalization of agenda for Round Table Discussion held during August 21-25, 2017 at New Delhi.
- Meetings regarding charting Roadmap for conducting Workshop on Technology Challenge for Housing chaired by Secretary, MoHUA on August 17 and 21, 2017 at New Delhi.
- 25<sup>th</sup> meeting of CSMC of PMAY(U) under the Chairmanship of Secretary, MoHUA on August 23, 2017 at New Delhi.
- Pre-Bid meeting of the Global Tender for construction of 40000 houses using new technologies under PMAY(U) on August 28, 2017 at Ranchi.

- 
- Meeting to review the progress in preparatory work for the celebration of World Habitat Day 2017 on August 30, 2017 at New Delhi.
  - Meeting on Way forward for India Housing Construction Technology Challenge (IHCTC) chaired by Secretary (HUA) on September 19, 2017 at New Delhi.
  - 26<sup>th</sup> meeting of CSMC of PMAY(U) under the Chairmanship of Secretary, MoHUA on September 27, 2017 at New Delhi.
  - Meeting chaired by JS&MD (HFA) to discuss the Website Portal Designing and Application Form for India Housing Construction Technology Challenge (IHCTC) on October 3, 2017 at New Delhi.
  - 52<sup>nd</sup> meeting of the Executive Committee of BMTPC held under the Chairmanship of Secretary, MoHUA on October 23, 2017 at New Delhi.
  - 27<sup>th</sup> meeting of CSMC of PMAY(U) under the Chairmanship of Secretary, MoHUA on October 30, 2017 at New Delhi.
  - 22<sup>nd</sup> meeting of the Civil Engineering Division Council, CEDC on November 15, 2017 at BIS, New Delhi
  - 1<sup>st</sup> meeting of Technical Expert Committee for finalization of ToR for the Agency/Consultant engaged for framing of National Guideline for Disaster Risk Assessment on 23.11.2017 at New Delhi.
  - 28<sup>th</sup> meeting of CSMC of PMAY(U) under the Chairmanship of Secretary, MoHUA on November 29, 2017 at New Delhi.
  - Meeting chaired by Secretary (HUA) on 'Technology Submission and representative of KEF Infra and related organizations on December 18, 2017 at New Delhi.
  - Meeting to discuss issues related to Global Housing Technology Challenge (GHCTC) Chaired by Secretary, MoHUA on December 22, 2017 at New Delhi.
  - 29<sup>th</sup> meeting of CSMC of PMAY(U) under the Chairmanship of Secretary, MoHUA on December 27, 2017 at New Delhi.
  - Hindi Salahkar Samiti meeting chaired by Shri Hardeep Singh Puri, Hon'ble State Minister of Housing & Urban Affairs on January 16, 2018 at New Delhi.

- Interactive Session on New Construction Technologies for Housing on January 18, 2018 at CPWD, New Delhi.
- High Level Technical Committee meetings to evaluate Prefabricated Technology on January 22-23, 2018 at Kerala
- Meeting Chaired by Secretary (HUA) on Global Housing Technology Challenge on February 01.02. 2018 at New Delhi.
- 30<sup>th</sup> meeting of CSMC of PMAY(U) under the Chairmanship of Secretary, MoHUA on February 7, 2018 at New Delhi.
- 13<sup>th</sup> meeting of the Technical Assessment Committee (TAC) of PACS held on February 16, 2018 at New Delhi.
- 53<sup>rd</sup> meeting of the Executive Committee of BMTPC held under the Chairmanship of Secretary, MoHUA on February 2, 2018 at New Delhi.
- Special Meeting of the Board of Management chaired by Hon'ble Minister of State (I/C) for HUA and President, BOM, BMTPC on February 26, 2018 at New Delhi.
- 31<sup>st</sup> meeting of CSMC of PMAY(U) under the Chairmanship of Secretary, MoHUA on February 27, 2018 at New Delhi.
- 32<sup>nd</sup> meeting of CSMC of PMAY(U) under the Chairmanship of Secretary, MoHUA on March 26, 2018 at New Delhi.
- Special Meeting of the Board of Management chaired by Hon'ble Minister of State (I/C) for HUA and President, BOM, BMTPC on March 28, 2018 at New Delhi.

---

**IV. OTHERS**

- The Ministry of External Affairs, Govt. of India constituted a Technical team comprising of the representatives from BMTPC, HPL and CBRI which visited Myanmar to understand the ground situation, to identify the most appropriate housing solution and interaction with Myanmar Authorities for construction of houses for rehabilitation of returnees in the Rakhine. State led by Dr. Shailesh Kr. Agrawal, ED, BMTPC. The Rakhine State in Myanmar had witnessed a crisis since August 25, 2017 that was triggered by a series of terrorist attacks leading to loss of lives amongst the security forces as well as the civilian population. This had led to the exodus of a large number of people from Rakhine State, many of whom had sought shelter in neighbouring Bangladesh. In order to restore peace in the state, Govt. of India (GoI) committed to provide financial and technical assistance to Govt. of Myanmar (GoM) for construction of temporary and permanent houses in Rakhine state in conjunction with the local authority. The team has conducted the field investigations and interactions with the officials of Government of Myanmar during 5-9 February 2018 and submitted the report to the Ministry of External Affairs, Govt. of India.
- Member of the Committee constituted by CPWD to bring out improvement in Border Outposts (BOPs) through Innovative technologies promoted by BMTPC
- The Price Waterhouse Coopers (PWC) approached BMTPC for bidding jointly for the project "Owner-led Housing Reconstruction and Retrofitting Houses" in Nepal. BMTPC coordinated with PWC officials and prepared documents for submission of bid.
- As member of team, assessed the claim of M/s Marda Industries Private Limited, Vill – Narbong, Dist- Byrnihat, (Meghalaya), M/s Superlite AAC Blocks Industry, Sarutari, Sonapur, Byrnihat, Distt. Kamrup (M) Assam, M/s Uranus Stone Products & co., Killing Village, Ri- Bhoi District, Meghalaya and M/s B.R. Metallics (Unit AAC Block), Moranjana, Rangia, Distt. Kamrup (R) Assam under Central Capital Investment Subsidy Scheme (CCIS), 2007 of Department of Industrial Policy and Promotion, Ministry of Commerce and Industry.

- NCR Planning Board under MoHUA had convened a meeting regarding empanelment of National Institutions for providing Project Appraisal Services on Recurring Price Contract Basis. BMTPC has submitted offer for appraisal of projects under Land Development, Buildings and social infrastructure sector.
- BMTPC participated in the National Student Design Competition on Housing for All organised by Department of Architecture & Planning, IIT Roorkee during 22-23 July, 2017. As a Jury member, the Council helped in selection of best conceptual projects in the context of Housing for All. IIT Roorkee is documenting the award winners.

**ANNEXURE II****PAPERS PRESENTED/PUBLISHED INCLUDING PRESENTATIONS MADE**

- Presentation on “Emerging Construction Systems for Mass Housing” during Sensitization Programme on Emerging Technologies organised by BMTPC at Bhubaneswar, Odisha on May 15, 2017.
- Presentation on “New Construction Technologies promoted by BMTPC” during Training Programme for the Senior Personnel of Housing Cooperatives from 22nd to 25th June, 2017 organized by NCHF at Dehradun, Uttarakhand
- Presentation on “Emerging Construction Systems for Mass Housing” during Workshop on Performance Evaluation of Housing Units organised by IIT Kanpur at their Extension Centre, Noida from July 21-22, 2017.
- Presentation on “Use C&D Waste in Building Construction” during Workshop on Eco-friendly Processing and Use of Construction & Demolition Waste” organized by C-FARM & Municipal Corporation of Greater Mumbai at Mumbai on 25th July, 2017.
- Presentation on “Emerging Construction Systems for Mass Housing” during Round Table on India Housing Construction Technology Challenge organised by MoHUA on August 25, 2017, New Delhi.
- Presentation on “Emerging Construction Systems for Mass Housing” during CPWD Training Programme, at National CPWD Academy, Ghaziabad on September 12, 2017.
- Paper on “Government’s Initiatives towards Housing Policies: Affordable Homes” published in Special Issue of BMTPC Newsletter “Nirman Sarika” on the occasion of World Habitat Day, October, 2017.
- Paper on “Impediments in using Emerging Construction Systems for Mass Housing” published in Special Issue of BMTPC Newsletter “Nirman Sarika” on the occasion of World Habitat Day, October, 2017.

- Paper on “Paramrik Chhatt Nirman Prandaliyan” in Hindi published in Special Issue of BMTPC Newsletter “Nirman Sarika” on the occasion of World Habitat Day, October, 2017.
- Presentation on “Alternate Building Materials & Products : Need to Reuse & Recycle Waste” during Workshop on Utilization of C&D Waste in construction of Dwelling Units & related Infrastructures organised by BMTPC at Hyderabad, on 8th November, 2017.
- Presentation on “Emerging Building construction technologies for Mass housing” for CPWD Engineers & Architects in CPWD Training Academy Gaziabad on November 17, 2017
- Presentation on “Alternate Building Materials & Products : Need to Reuse & Recycle Waste” during Workshop on Utilization of C&D Waste in construction of Dwelling Units & related Infrastructures organised by BMTPC at New Delhi, on 21 November, 2017.
- Presentation on “Emerging Construction Systems for Mass Housing” during Workshop organised by ICI, Lucknow Centre & UltraTech Cement Ltd. on December 2, 2017 at Kanpur.
- Paper on “The Five Ws of Emerging Construction Technologies” published in the Proceedings entitled “Building Materials and Housing Technologies for Sustainable Development” of the National Seminar on Emerging Building Materials and Construction Technologies, February 22-23, 2018, New Delhi.
- Paper on “New Building Technologies for Affordable Housing” published in the Proceedings entitled “Building Materials and Housing Technologies for Sustainable Development” of National Seminar on Emerging Building Materials & Construction Technologies, February 22-23, 2018, New Delhi.
- Presentation on “Emerging Construction Systems for Mass Housing” during National Conference on Sustainable Construction Practices using Innovative Materials and Methods organised on March 23-24, 2018 by PSG Institute of Technology and Applied Research at Coimbatore.



**PUBLICATIONS BROUGHT OUT DURING THE YEAR**

1. Special Issue of Newsletter “Nirman Sarika” on the theme of the World Habitat Day 2017 “Housing Policies: Affordable Homes”
2. Guidelines for utilization of C&D waste – for construction of dwelling units and related infrastructure in housing schemes of the Government Pocket book on Emerging Construction Systems
3. Compendium of Prospective Emerging Technologies for mass Housing - Second Edition
4. Seismic Retrofitting of Masonry Buildings - A Compilation of Case Studies
5. Guidebook for Barbenders - Magdarshika for Barbenders (in Hindi)
6. Guidebook for Shuttering Artisans - Magdarshika for Shuttering Artisans (in Hindi)
7. Building Materials and Housing Technologies for Sustainable Development
8. Exhibitor’s Catalogue on Emerging Building Materials & Construction Technologies







---

**Building Materials and Technology Promotion Council**

Ministry of Housing & Urban Affairs, Govt.of India

Core-5A, First Floor, India Habitat Centre,

Lodhi Road, New Delhi

Tel: 91-11-24636705, 24638097, Fax: 91-11-24642849

E-mail: [info@bmtpc.org](mailto:info@bmtpc.org)



[@bmtpcdelhi](https://twitter.com/bmtpcdelhi)



[bmtpc.bmtpc](https://www.facebook.com/bmtpc.bmtpc)



[www.bmtpc.org](http://www.bmtpc.org)