



# BUILT ENVIRONMENT

BI-MONTHLY PUBLICATION OF INDIAN BUILDINGS CONGRESS



Bharat Mandapam, Pragati Maidan, New Delhi



# INDIAN BUILDINGS CONGRESS

## TRAINING CALENDAR 2024

Sl. No.	Program Title	*Tentative Dates
1.	Quality, Safety, Health, & Environment Aspects in Construction	January, 2024
2.	RCC Work	February, 2024
3.	Brick Work and Plastering in Construction	March, 2024
4.	Executive Development Program on “Planning, Design and Installation of Plumbing Systems in Buildings”	April, 2024
5.	Basics of E & M Systems in Buildings for Engineers & Architects	May, 2024
6.	Planning Design and Tendering for Electric Substation and Power Distribution System for a Building Complex	June, 2024
7.	Architectural Hardware in Buildings	July, 2024
8.	Internal Cladding Systems in Buildings	August, 2024
9.	Tile Master Training for Engineers	September, 2024
10.	Planning, Execution, Operation and Maintenance Management of E&M Systems in Buildings for Engineers & Architects for Engineers & Architects	October, 2024
11.	Planning, Design, Installation, Operation and Maintenance Management of HVAC Systems in Buildings	November, 2024
12.	Sustainable Built Environment	To be mutually decided by Director Ex. Training, ITBP, IBC HQ and the Sponsoring Organization
13.	Training of JEs/AEs of State PWDs	
14.	Management of EPC Contracts	
15.	Management of Contract Claims & Resolution of Disputes	

\*The actual date/ dates of the program will be announced while sending the invitation for nominations.

### Fees Structure:

- Two Days Training Program  
Rs.6000/- plus GST per participant
- One Day Training Program  
Rs.4500/- plus GST per participant

### Venue:

IBC HQ, Sector VI, Kama Koti Marg,  
R.K. Puram, New Delhi - 110022  
Group Programs can also be arranged at  
outstation on request.

For nominations, please email to [director.itpcibc@gmail.com](mailto:director.itpcibc@gmail.com) / [info@ibc.org.in](mailto:info@ibc.org.in)  
addressed to The Director, Executive Training, IBC HQ, R.K. Puram, New Delhi -110 022

### Contact us

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# CONTENTS

<b>From President's Desk</b> .....	2
<b>IBC News</b>	
IBC Delegation meets CMD, NBCC (India) Limited.....	3
IBC Participated in 82 <sup>nd</sup> IRC Annual Convention at Gandhinagar .....	3
<b>Activities of Local/State Chapters</b>	
Chhattisgarh State Chapter- Raipur .....	4
Bikaner Local Chapter .....	6
Arunachal Pradesh State Chapter – Itanagar.....	7
Tripura State Chapter – Agartala.....	8
Meghalaya State Chapter – Shillong.....	10
Mizoram State Chapter-Aizawl.....	11
Assam State Chapter-Dispur.....	11
Nagaland State Chapter-Kohima.....	12
<b>National News</b>	
A Temple being built to last ages - Ram Temple.....	14
India's First Autonomous Car .....	15
PM Modi Inaugurates New ITPO Complex 'Bharat Mandapam'.....	15
India's Photovoltaic potential amidst Air Pollution and Land Constraints.....	16
अब टूटे हुए कांच को जोड़ना होगा आसान .....	17
प्लास्टिक कचरा से बनाया अग्निरोधी बोर्ड .....	17
<b>International News</b>	
Musical Road .....	18
Fog Harvesting.....	20
List of New Members of IBC.....	22
From Editor-in-Chief Desk (Inside of Back Cover)	



## From President's Desk



In recent times, the significance of robust disaster management practices has become more pronounced than ever, especially in a country as diverse and dynamic as India. The need for effective disaster management strategies cannot be overstated, given the frequent occurrences of natural calamities and unforeseen crises across the nation.

India, with its varied geographical features and climatic conditions, faces a myriad of challenges in managing disasters. From devastating floods in various States to landslides in Uttarakhand and cyclones in coastal regions, the country bears witness to a wide array of natural disasters that demand swift and well-coordinated responses.

The tragic incident in the Silkiyari Tunnel in Uttarakhand, where 41 workers were trapped, is a poignant reminder of the criticality of disaster preparedness and rapid response mechanisms. It underscores the imperative for robust engineering solutions and efficient disaster management protocols tailored to the unique geographical and infrastructural landscapes of our nation.

Furthermore, the ongoing global climate change crisis amplifies the frequency and intensity of these disasters, emphasizing the urgency for proactive measures and innovative approaches in disaster management.

As we navigate through these challenging times, it is imperative to leverage technological advancements, interdisciplinary collaborations, and community participation to bolster our disaster resilience. The amalgamation of research, education, and real-time implementation of best practices is crucial to minimizing the impact of disasters and ensuring the safety and well-being of our communities.

The Silkiyari tunnel project highlighted how traditional manual tunneling techniques, like the rat mining method, shed light on the importance of considering and integrating traditional methods alongside modern technologies for more effective outcomes in certain contexts.

Through this journal, let us collectively advocate for a paradigm shift in our approach towards disaster management. Let us delve into contemporary examples, analyze the evolving landscape of challenges, and propose sustainable solutions to fortify our nation's resilience in the face of adversity.

(Maj. General Ashok Kumar)  
DGW



## IBC News

### IBC Delegation meets CMD, NBCC (India) Limited



CMD, NBCC with IBC Delegates

IBC delegation comprising of Shri Rajeev Kumar Gupta, Honorary Secretary, IBC and Shri Vijay Kumar Choudhary, Honorary Treasurer, IBC met Shri K.P. Mahadevaswamy Chairman and Managing Director, NBCC (India) Limited on 31.10.2023 in his chamber at NBCC Bhawan, Lodhi Road, New Delhi.

The CMD, NBCC warmly welcomed the IBC delegation. He was felicitated by the delegation by offering him flowers bouquet. The delegation briefed him about the technical activities of IBC and IBC Publications. Bi-monthly Bulletin, July-August 2023 and two IBC publications (Preliminary Publication-June 10-11, 2023 and IBC Journal-June 2023) released during the 26th Annual Convention, held in June 10-11, 2023 at A.P. Shinde Symposium Hall, NASC Complex, ICAR, PUSA, New Delhi were presented to him.

The Delegation solicited continued support of NBCC in all technical activities of IBC and requested him to advise NBCC professionals to associate with IBC by enrolling them as its life members, and also expressed that their association and participation in the activities of IBC could enhance the cause of Built Environment. Shri Mahadevaswamy assured that NBCC will continue to extend its whole hearted support to IBC.

At the end, Honorary Secretary, IBC thanked the CMD,

NBCC (India) Limited for sparing his valuable time for IBC delegation and for their positive approach in various IBC activities.

### IBC Participated in 82<sup>nd</sup> IRC Annual Convention at Gandhinagar

Indian Buildings Congress (IBC) participated actively in 82<sup>nd</sup> Annual Session of the Indian Roads Congress (IRC) held at Mahatma Mandir Convention and Exhibition Centre, Gandhinagar (Gujarat) between 1st to 5th December 2023. On the request of Honorary Secretary IBC, a complementary stall was allotted to IBC in the Exhibition by Gujarat Roads & Buildings Department.



IBC Stall visited by Hon'ble Minister Shri Nitin Gadkari & Hon'ble CM of Gujarat Shri Bhupendrabhai Patel

Shri Nitin Gadkari, Hon'ble Minister of Road Transport & Highways, Hon'ble CM of Gujarat Shri Bhupendrabhai Patel and Prof. Manoranjan Parida, Director, CSIR-Central Road Research Institute, Shri H.C. Modi, Chairman, CE, N.H. & A.S. Gandhinagar visited IBC stall and appreciated the activities carried out by IBC.

IBC periodicals and selected IBC publications were also displayed and offered for sale. IBC stall generated great interest amongst the visitors and there was a large footfall from delegates of the session. On the spot enrolment of IBC Membership was also available at Counter. 21 Members took membership on the spot and priced publications amounting to Rs 6000/- were sold.

IBC members and GC members from Gujarat State Chapter were present at IBC counter to brief the visitors about the Indian Buildings Congress. Their presence specially GC members Ar. Purushottam P. Doijode, Joint Director (Architect) MES, Shri Shubham Shah,

Shri P.J. Mishra and Shri Mahendra Pal, IDSE CE (AF), Chairman helped in enrolment of IBC membership.



Certificate of Participation presented to IBC

The Organising Team of 82<sup>nd</sup> Annual Session of IRC extended warm welcome and support along with the certificate of participation to IBC.

## Activities of State/Local Chapters Chhattisgarh State Chapter- Raipur

### 32<sup>nd</sup> Foundation Day of the Indian Buildings Congress, Raipur

32<sup>nd</sup> Foundation Day of the Indian Buildings Congress was celebrated by organising a technical talk on “**Microplastics – Emerging Pollutants of Concern**” on 1st September 2023 in the hall of, National Institute of Technology (NIT) Campus, Raipur, Chhattisgarh. The technical talk was attended by large number of professionals from construction Industry.

The inaugural function started with welcoming guest speaker Dr. Sameer Bajpai, Professor, National Institute of Technology, Raipur with floral Bouquet by Chhattisgarh State Chapter, Chairman and Vice President of Indian Buildings Congress Shri Salil Rai Shrivastava, OSD, Housing and Environment, Government of Chhattisgarh.

Shri S. K. Agrawal, Past Vice President, IBC in his address informed about the Journey of IBC since its inception in 1992 and its contribution in the promotion of Built Environment which is sustainable, affordable, green and energy efficient.



Sh. S. K. Agrawal, Sh. Salil Rai Shrivastava, Dr. Sameer Bajpai, Guest Speaker, Sh. Rajesh B. Thakare, Sh. D. S. Paroha for Technical Talk on Microplastics – Emerging pollutants of concern

Dr. Sameer Bajpai, Professor, National Institute of Technology, Raipur in his technical talk informed that we are living in Plastics Age or Era. The world is being inundated by plastics. More than 400 million tonnes of plastics is produced every year, half of which are designed to be used only once. Of that, less than 10 per cent is recycled. An estimated 19-23 million tonnes end up in lakes, rivers, and seas. Plastics clog our landfills, leaches into the ocean and is combusted into toxic smoke, making it one of the gravest threats to the planet. Plastic pollution is closely related to Anthropocene – affects the natural geochemical cycles, ecosystem functioning and ecosystem services. Microplastics are a diverse contaminant group ranging from 1 to 5000 micron in thickness, involving many polymers, additives, morphological, colors and originating from countless sources.

He added about Indian Scenario that the Plastic Waste Management Rules, 2016 were notified by the Union Ministry of Environment, Forest & Climate Change in March 2016. While a nationwide ban on single-use plastic products came into effect in Oct 2019, no emphasis has been put on microplastics. Authorities haven't even recognized microplastic as pollutant yet. A study conducted by Toxic Links in March 2018 confirmed that microplastics were indeed present in 50 per cent of face wash products commonly found in the Indian market. More than 30 per cent toothpaste products were found to contain microplastics. The Bureau of Indian Standards did a study and classified microbead products as 'not fit for use' in May 2017, in pursuance of the National Green Tribunal (NGT) order

for analysis of microbeads in cosmetics. However, till now there is no notification from the government banning the use of microplastics.

Dr. Bajpai, suggested corrective measures outlined in the WHO report, consistent with the European Union Plastics Strategy, the following measures are proposed to prevent entry of plastics into the environment :

1. Reducing manufacture of plastics.
2. Reusing what exists and replacing plastics with alternative materials where appropriate.
3. Prioritise preventing plastic waste.
4. Improve the economics and quality of plastics recycling.
5. Drive innovation and investment towards circular solutions and sustainable manufacturing practices to decrease the input of plastic waste to the environment.
6. To end plastic pollution - all areas of the plastics lifecycle – from the extraction of material to manufacturing, use and disposal.
7. Banning unnecessary plastics, toxic additives, and waste exports.
8. Engage in international initiatives to minimize and eliminate plastic waste.

He suggested IBC to take up the training and organising awareness programme for the Engineers and public in general.

To mark the occasion mementoes were also presented to the Speaker at the end of the technical talk Dr. Goverdhan Bhatt, Honorary Secretary, and Shri Anil Tiwari, Joint Secretary, IBC, Chhattisgarh State Chapter, Raipur presented the vote of thanks.

### **Formation of IBC Bhilai Chapter**

Shri Salil Rai Shrivastava, Vice President, IBC visited Bhilai on September 9, 2023. The main purpose of his visit was to formulate a local chapter to encourage professionals of the area to take active part in the activities of Indian Buildings Congress. He was accompanied by Shri S. K. Agrawal, Past Vice President of IBC, Shri Alok Mahawar, Dr. Debasis Sanyal and Shri Rajesh B. Thakare Governing Council members, Sh. Anil Tiwari, Joint Secretary, Sh. Dipak Shirke, Treasurer, IBC, CSC, Raipur during the visit.

A meeting was organised in a public hall by the members of IBC. More than 60 members attended the function. The participants were from various Government and Non-government organisations such as SAIL, NBCC, R&D Academicians, CPWD, private companies, builders and developers, valuers, Engineering consultants and students.

Shri Salil Rai Shrivastava and Shri S. K. Agrawal in their welcome addresses briefly introduced the history of IBC. They highlighted the various programmes, seminars, technical lectures, publication of books undertaken by IBC.

Dr. Rajesh Tamrakar in his address appreciated the initiatives taken by IBC to formulate a local chapter in the area and to involve professionals and students in the activities.

Sh. Sanjeev Kasliwal proposed vote of thanks to the visitors and attendees.

With the consent of all participants present in the meeting, IBC Bhilai Chapter was formed with following composition.

Chairman - Dr. Rajesh Tamrakar, Structural Designer, Self Employed; Secretary -Shri Sanjeev Kasliwal, Structural Engineer, M/s Sanjeev Kasliwal & Associates; Treasurer – Shri Shubrakant Tamrakar, Director, Civil Technical Solutions.

### **Meeting with Director, NIT Raipur**

A meeting was organised on September 12, 2023 in the office of the Dr. N. V. Ramana Rao, Director, National Institute of Technology, Raipur by Shri Salil Rai Shrivastava, Vice President, IBC. Shri Salil Rai Shrivastava was accompanied by Shri S. K. Agrawal, Past Vice President of IBC, Shri Alok Mahawar, Dr. Debasis Sanyal, Professor, NIT, Raipur and Shri Rajesh B. Thakare Governing Council members, Dr. Govardhan Bhatt, Hon. Secretary, Sh. Anil Tiwari, Joint Secretary, Sh. Dipak Shirke, Treasurer, IBC, CSC, Raipur, Dr. G. D. Ramtekkar, Professor, NIT, Raipur during the visit.

Dr. N. V. Ramana Rao, Director, National Institute of Technology, Raipur expressed his willingness and instructed the concern persons to include the National Institute of Technology, Raipur as an Institutional member of the Indian Buildings Congress.



## Engineers Day celebrated by IBC Chhattisgarh State Chapter- Raipur



Left to Right: Shri. P. N. Singh, Shri. Hemant Verma, Dr. R. V. Ramana Rao, Dr. Govardhan Bhatt, Dr. M. K. Verma, Shri Kamal Sarada, Dr. M. L. Verma

34<sup>th</sup> Engineers Day was organised on September 15, 2023, on the occasion of 163<sup>rd</sup> birth Anniversary of Bharat Ratna, Dr. M. Visveswaraya at Ram Swarup Dharmashala, VIP Road, Raipur jointly by Sanyukt Abhiyanta Ayojan Samiti, Raipur along with 20 other organisations including Indian Buildings Congress, Chhattisgarh State Chapter, Raipur. The programme was organised by Shri P. N. Singh, Shri P. K. Khare, Shri Yogesh Sharma, Shri C. P. Sharma and Dr. M. L. Agrawal, Engineering in Chief, Public Health Engineering Department, Government of Chhattisgarh, Raipur.

The programme started with garlanding to Sir M. Visveswaraya statue at M. Visveswaraya Chowk, Civil Lines, Raipur, Chhattisgarh, and remembering contributions of Dr. M. Visveswaraya to the Nation by Shri Aizaz Dhebar, Mayor, Raipur, Shri Pramod Dubey, Sabhapati, Raipur, Shri Shailesh Nitin Trivedi, Chairman, Pathya Pustak Nigam, Government of Chhattisgarh. On this occasion, a blood donation camp was also organized in which many engineers donated blood to Thalassemia Society of India.

Indian Buildings Congress members, Shri Manoj Verma, Shri M. L. Haldkar, Dr. Govardhan Bhatt, Shri Rajesh B. Thakare, Shri Kapil Chandiok were awarded Excellent Engineer of the year 2023 award from various department or organisation at the hands of honourable guests.

The Programme was well attended by over 600 Engineers and their families. Dr. M. L. Agrawal presided over the function and Shri G. K. Manon, Hony. Secretary delivered Vote of Thanks.

## Celebration of Engineers Day & Teachers Day by the Institute of Engineers (I) along with Indian Buildings Congress

34<sup>th</sup> Engineers Day and Teachers Day were organised on the September 18, 2023, on the occasion of 163<sup>rd</sup> birth Anniversary of Bharat Ratna, Dr. M. Visveswaraya at Vrindavan Hall, Civil Lines Road, Raipur organised by the Institute of Engineers, (India), Raipur Local Chapter, Raipur along with Indian Buildings Congress, Chhattisgarh State Chapter, Raipur. The programme was organised by Dr. Vinay K. Pandey, President, IEI Local Chapter, Shri Prakash Upadhyay, Hon. Secretary, IEI, Raipur Local Chapter, Raipur.



Left to Right: Shri Alok Mahawar, Dr. Vinay K. Pandey, Dr. N. V. Ramana Rao, Shri Salil Rai Shrivastava, Shri Prakash Upadhyay

Dr. N. V. Ramanna Rao, Director, National Institute of Technology, Raipur, was the Chief Guest. Shri. Salil Rai Shrivastava, OSD, Housing and Finance, Government of Chhattisgarh, Naya Raipur and Chairman, Indian Buildings Congress, Chhattisgarh State Chapter, Raipur was the Guest of Honour.

Engineer of the year 2023 has been awarded to Shri Alok Mahawar and Dr. Ajay Garg. The Programme was well attended by over 100 Engineers and their families. Dr. Vinay K. Pandey presided over the function and Shri Prakash Upadhyay, Hony. Secretary delivered Vote of Thanks.

### Bikaner Local Chapter

### Formation of IBC Bikaner Chapter

A meeting of Indian Buildings Congress members was held on September 6, 2023 at Zonal Conference Hall of PWD Bikaner under the Chairmanship of Shri C.L.Verma, Fmr. Chief Engineer & Addl. Secretary, Rajasthan PWD.





Meeting in Progress

All the technical staff of PWD Circle Bikaner along with RSRDC unit Bikaner attended this meeting with full enthusiasm. Shri C.L. Verma Chairman, IBC Jaipur Chapter greeted the existing members of IBC of Bikaner District. Discussion started with the working of IBC and its objective, seminars conducted every years and contribution of IBC in development of Building Construction and Technology.

Many trending issues like Green buildings, water proofing of buildings, prestigious building construction awards were covered. Shri Verma encouraged and motivated newly recruited Assistant & Junior Engineer to join IBC and contribute to the Building Technology and Research field. Information about publications of IBC was shared in the meeting.

Agenda of Meeting of IBC Chapter, Bikaner was also discussed and names of proposed working committee of IBC Chapter Bikaner were also announced by Shri Verma, Chairman Jaipur Chapter.

The proposal for formation of Adhoc Committee of IBC, Bikaner Chapter was prepared for forwarding to IBC Headquarters for approval.

It was also promised to organize an official meet of delegates of IBC Council in Bikaner when Life membership number reaches at least 50.

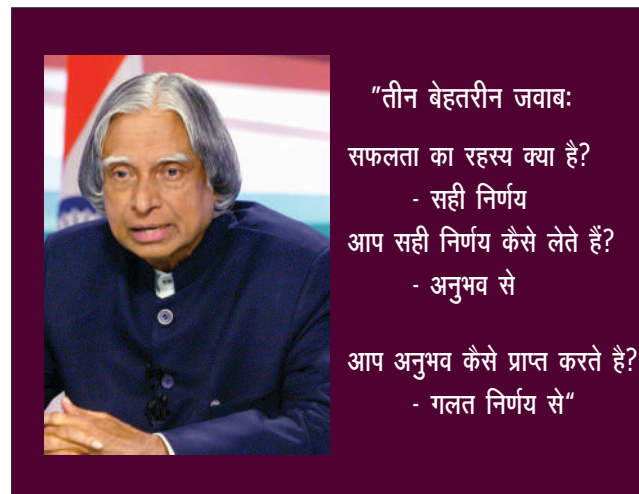
A Vote of thanks was virtually addressed by Shri Mukesh Gupta Superintending Engineer PWD Circle Bikaner. He thanked Shri C.L.Verma and all the participants for sparing their valuable time.

Finally, all the participants thanked to the Host of this event Shri Sunil Gehlot, Executive Engineer PWD Distt. Dn. II Bikaner assisted by Shri Rohitashaw Singh, Assistant Engineer (Monitoring) PWD Circle Bikaner.

## Arunachal Pradesh State Chapter -Itanagar Committee Meeting

A special Meeting of Indian Buildings Congress, Arunachal Pradesh Chapter was held on 16<sup>th</sup> Sept, 2023 at 3.00 pm at the Golden Jubilee State Banquet hall, Itanagar at the initiation of Shri C. Debnath, Vice President of IBC with the support of Arunachal Pradesh Engg. Services Association (APESA). The meeting was presided over by Dr. Toli Basar, Fmr. Sr. CE, NH, Arunachal Pradesh & also Council Member, IBC.

At the outset, Shri C. Debnath, Vice President, IBC briefed about the IBC, its activities and various issues related with the IBC alongwith rules & regulations for continuation of activity of the Chapter. It was also appealed by the Vice President for special membership drive as well as the clearance of Institutional membership fees. It has been discussed to have the accommodation for Office of IBC, Arunachal Pradesh Chapter in the PWD Complex, Arunachal Pradesh. It was also decided to request to IBC HQ to initiate proposal to the Chief Secretary, Govt. of Arunachal Pradesh with copy to Secretary, PWD for providing rooms in the Office Complex of PWD. At the end, the proposal for formation of adhoc Committee of IBC, Arunachal Pradesh Chapter was prepared for forwarding it to IBC HQ for consideration & approval. The meeting ended with vote of thanks offered by Shri Nabam Takar.



"तीन बेहतरीन जवाब:  
सफलता का रहस्य क्या है?  
- सही निर्णय  
आप सही निर्णय कैसे लेते हैं?  
- अनुभव से  
आप अनुभव कैसे प्राप्त करते हैं?  
- गलत निर्णय से"

## Tripura State Chapter - Agartala 17<sup>th</sup> Annual General Meeting



Maj. General Ashok Kumar, President, IBC being welcomed by Shri M.S. Roy, Chairman, IBC, Tripura Chapter

Indian Buildings Congress, Tripura Chapter organised its 17<sup>th</sup> Annual General Conference on 23<sup>rd</sup> September, 2023 in the Recreation Hall, Netaji Chowmohani, PWD Complex, Agartala, Tripura and on 24<sup>th</sup> September, 2023 at Sukanta Academy, Agartala. Shri M.S. Roy, Chairman, IBC Tripura Chapter welcomed Major General Ashok Kumar, President, IBC & Director General (Works), E-in-C Branch, New Delhi and Dr. Ganesh Chandra Saha, Pro-VC, Dhaka International University & professor Deptt. of Civil Engineering, Dhaka University of Engineering and Technology, Bangladesh and two other delegates of Bangladesh.

Major General Ashok Kumar addressed the members before start of AGM. The names of elected Executive Committee members for the year 2023-2024 was announced by the Hony. Secretary.

Chairman- Shri M.S. Roy, CE, ONGC; Vice Chairman- Shri Sibasish Bhattacharyya, Director, JSS; Hony. Secretary - Shri Biswajit Das, EE, PWD; Treasurer -

Shri Nayan Kr. Bhowmik, Fmr. EE, PWD; Executive Members Shri Abhijit Debray, Asst. Lecturer, TIT; Shri Nirmal Debnath, JE, PWD; Shri Sanjoy Paul, JE, PWD; Shri Rati Ranjan Debnath, EE, PWD; Ms. Supriya Datta, AE, PWD; Shri Biswajit Ghosh, JE, PWD; Shri Sumit Majumder, AE, RDD.

### Business Session

The Business Session of 17<sup>th</sup> Annual General Conference held on 23<sup>rd</sup> September, 2023 at the Recreation Hall, Netaji Chowmohani, PWD Complex, Agartala, Tripura and presided over by Shri M.S. Roy, Chairman, IBC, Tripura Chapter. Shri Biswajit Das, Honorary Secretary, IBC Tripura Chapter welcomed all the members in the Business Session and read out the Minutes of 16<sup>th</sup> Annual State Conference, held on 4<sup>th</sup> September 2022. The Minutes of 16<sup>th</sup> Annual State Conference was approved by the house unanimously.

The business session was concluded with vote of thanks. A dinner was hosted by IBC Tripura Chapter.

### Inaugural Function



Lighting of Ceremonial Lamp

The Inaugural Function was held on 24<sup>th</sup> September, 2023 at Sukanta Academy, Agartala. Shri Biswajit Das, Honorary Secretary, IBC, Tripura Chapter welcomed the Chief Guest Major General Ashok Kumar, President, IBC and Director General (Works), E-in-C Branch, New Delhi and all the dignitaries on the dais and off the dais. The lighting of ceremonial lamp was followed by "IBC Inaugural Song". The programmes were presided over by Shri M.S. Roy, Chairman, IBC, Tripura Chapter. The



Souvenir of 17th Annual General Conference was also unveiled by the dignitaries on the dais. Mementos were presented to the dignitaries by Shri M.S. Roy, Chairman & Shri Biswajit Das, Honorary Secretary, IBC, Tripura Chapter.

Inaugural Speeches were delivered by Shri Rajib Debbarma, CE, PWD (R&B) and Governing Council Member of IBC; Dr. Ganesh Chandra Saha, Pro-VC, Dhaka International University; Dr. Debasish Bandhyopaphyay, Professor & Former Head, Department of Construction Engineering, Jadavpur University, Kolkata and Major General Ashok Kumar, President, IBC.

Shri M.S. Roy, Chairman, IBC Tripura Chapter delivered Presidential Speech.

The Inaugural function concluded with "IBC Valedictory Song" followed by Tea.

## Technical Seminar on High Rise Building – Issues & Concern



President, IBC along with newly elected Committee Members of IBC Tripura Chapter

The Technical Seminar started with introductory Speech by the Chairman of the Session. Shri Dipak Ch. Das, Fmr. Engineer-in-Chief, PWD, Tripura; Dr. Debasish Bandhyopaphyay, Professor & Fmr. Head, Department of Construction Engineering, Jadavpur University Kolkata; Dr. Ganesh Chandra Saha, Pro-VC, Dhaka International University; Shri R.K. Majumder, FIE, IAS (Retd.), Former Director, Urban Development Department, Govt. of Tripura and Past Chairman, IBC, Tripura Chapter and Shri Sanjay Nandanwar, Vice

President, Head PAG, Jindal Steel & Power presented power point presentations on the topic “**High Rise Building-Issues & Concern**”.

The technical seminar summed up by Shri Kapil Baran Bhowmik, Fmr. Dev. Officer, HUDCO Ltd. The closing remarks made by the Chairman of the Session Shri Dipak Ch. Das, Fmr. Engineer-in-Chief, PWD, Government of Tripura.

## Closing Ceremony

Shri Arif Mohammad Hon'ble Assistant High Commissioner, Bangladesh graced the closing ceremony as Chief Guest. Shri Animesh Das, IAS, Director Department of Science, Technology & Environment, Govt. of Tripura also graced the Closing Ceremony as Guest of Honour. Shri Biswajit Das, Honorary Secretary, IBC, Tripura Chapter welcomed all the dignitaries on the dais and off the dais. Shri C. Debnath, Vice- President, IBC placed the recommendation of seminar in the house. Subsequently, recommendations of the Seminar has been sent to the Government of Tripura for implementation.

## Recommendations of Seminar

1. Micro Zonation and site response spectrum to be made for Agartala Municipal Council.
2. Proper Geo-technical investigation including lateral capacity of piles to be conducted.
3. Dynamic analysis in addition to equivalent static analysis for the lateral load must be made and subsequently vetted through competent authority. Adequate lateral stiffener by providing shear wall, Core wall, dual system etc. in accordance to the specific height requirement must be employed for proper safety for the High Rise Buildings against Earthquake, Cyclone etc.
4. Ductile detailing of Reinforcement as per codal stipulation must be incorporated in the drawings and Quality Assurance Plan (QAP) during construction work must be adopted.
5. High performance concrete (self-compacting Concrete) with proper quality control is recommended for construction of High Rise Buildings.
6. Ductile Reinforcement of proper grade of Steel with necessary test certificate to be ensured.



7. Proper Fire safety regulations including gaps in between High Rise Buildings, evacuation plan must be in force.
8. Safety regulations during Construction must be followed.
9. Symmetrical Structural Plan and Compatible Architectural requirements for optimal design and planning are recommended.
10. Health Audit of High Rise Buildings at regular intervals are also recommended.
11. Green Buildings Compliances and Architectural feature in tune with specific natural landscape to be encouraged with incentive etc.
12. New proven technologies such as base isolation, liquid tune damper to be encouraged.

## Meghalaya State Chapter – Shillong Committee Meeting

A special meeting of IBC, Meghalaya Chapter along with joint venture programme with IBC, Tripura Chapter was held on Oct. 12, 2023 at Conference Hall of PWD, Govt. of Meghalaya at Lower Lachauchiere, Shillong. Meeting was Chaired by Er. K.K. Mawa, Chief Engineer (Roads), Govt. of Meghalaya. Er. G.K. Marak, Secretary PWD, Govt. of Meghalaya also joined the meeting later. A seminar on “Disaster Management” was organised jointly with IBC Tripura Chapter.



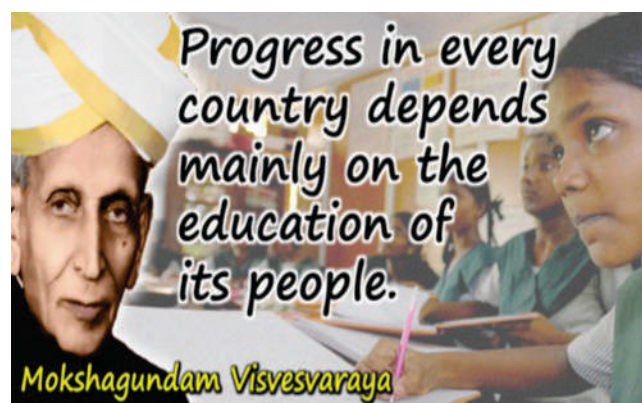
Shri C. Debnath, Vice President, IBC delivering the Speech

At the beginning, Er. D. Mawroh, Chief Engineer (Standard), PWD, Meghalaya and also Secretary, IBC, Meghalaya State Chapter delivered the welcome address. He mentioned that at the initiation of Er. C. Debnath, Vice President, IBC, New Delhi, this programme was organised with the support of PWD, Govt. of Meghalaya with special purpose of membership drive of IBC, formation of IBC Committee Meghalaya Chapter & Joint Venture seminar programme. He welcomed all in the meeting, specially the delegates of IBC, Tripura Chapter. Er. Biswajit Das, Hony. Secretary, IBC Tripura Chapter delivered speech and detailed about the activities of IBC, Tripura Chapter. Er. C. Debnath, Vice President, IBC spoke on the occasion. He informed about the activities of IBC HQ. He urged the Engineers present to take membership of IBC and also requested the Chapter to conduct the technical activity regularly. A presentation was made by Er. Hopeful Syiemiong, AEE, PWD, Meghalaya on “Disaster Management”.

Thereafter, Er. G.K. Marak, Secretary, PWD delivered Speech and assured his full support for membership drive and also assured for allotment of room in PWD Complex for IBC Meghalaya Chapter. Fifteen (15) Engineers applied for membership of IBC during this meeting.

The proposal for formation of Adhoc committee of IBC Meghalaya Chapter was prepared for forwarding to IBC Headquarters for approval.

Er. K.K. Mawa, CE, PWD (Roads) & Er. D. Mawroh, CE (Standards,) PWD delivered their speeches. The programme ended with the Vote of Thanks by Er. Ezekiel Lyngdoh, SE, PWD (Building), Meghalaya.



## Mizoram State Chapter-Aizawl Committee Meeting



Photographs with Participants

A special meeting of IBC, Mizoram Chapter was held on Nov. 17, 2023 at the Conference Hall of PWD, Govt. of Mizoram at Aizawl. Meeting was chaired by Er. Davis Sapzova, Chief Engineer (Planning), E-in-Chief's office, PWD, Govt. of Mizoram. A seminar on "Retrofitting of Structure" as a part of joint venture programme was organized jointly with IBC Tripura Chapter and with the support of PWD, Govt. of Mizoram.

At the outset, Er. Lalrinkima Hnamte, Engineer-in-Chief, PWD Mizoram delivered the welcome address and briefed about the background of the meeting. He mentioned that at the initiation of Er. C. Debnath, Vice President, IBC, New Delhi, this programme was organized with the support of PWD, Govt. of Mozoram with special purpose of membership drive of IBC, formation of IBC Committee of Mizoram Chapter & Joint venture seminar on programme on "Retrofitting of Building". He welcomed all in the meeting, specially the delegates of IBC, Tripura Centre.

Er. Biswajit Das, Hony. Secretary, IBC, Tripura Chapter delivered speech & detailed about the activities of IBC, Tripura Chapter and appealed for continuing such type of joint venture programme in future too by these two Chapters of IBC.

Er. C. Debnath, Vice President, IBC spoke on the occasion. He mentioned about the IBC HQ & also the Chapter activity. He urged upon the engineers to take membership of IBC and also requested the Chapter to conduct the technical activity regularly. He also viewed that after formation of chapter in all the North Eastern States, a special programme will be initiated on

"Infrastructure development in North Eastern Region of India" with the involvement of IBC centres in all 8 N.E. States, Building deptts. in 8 States and NEC to conduct at Guwahati or Shillong. After that two presentation on the topic was made by Er. Hrangthanga Zote, Chief Engineer, PWD (Building), Mizoram and Er. Kapil Baran Bhowmik, Former Dy. General Manager, HUDCO Ltd., Agartala.

Er. Lalrinkima Hnamte, the Engineer-in-Chief, PWD assured his all support for membership drive and also agreed for allotment of room in PWD complex for IBC, Mizoram Chapter. Twenty Seven (27) Engineers/Architects /faculty applied for membership of IBC and thus, the number of member of IBC belong to Mizoram State become 52.

The proposal for formation of Adhoc Committee of IBC, Mozore Chapter was prepared for forwarding to IBC Headquarters for approval.

The programme concluded with the vote of thanks offered by Er. H. Zoramliana, CE, PWD (NH), Govt. of Mizoram.

## Assam State Chapter-Dispur Committee Meeting



Meeting in Progress

A special meeting of IBC, Assam Chapter was held on Nov. 22, 2023 at the Conference Hall of PWD (Building), Govt. of Assam at Guwahati. Meeting was chaired by Er. Mahendra Mohan Das, Addl. Chief Engineer, PWD (Building), Govt. of Assam. A seminar on "Retrofitting of Structure" as a part of joint venture programme was organised jointly with IBC Tripura Chapter and PWD, Govt. of Assam.



At the outset, Er. Hiren Das, Chief Engineer. PWD (Building), Govt. of Assam delivered the welcome Address and briefed about the background of this special meeting. He mentioned that at the initiation of Er. C. Debnath, Vice President, IBC, New Delhi, this programme was organised with the support of PWD, Govt. of Assam with special purpose of membership drive of IBC, formation of IBC committee of Assam Chapter & Joint venture seminar programme on “Retrofitting of Structure”. He welcomed all in the meeting, specially the delegates of IBC Tripura Chapter.

Er. M.S. Roy Chairman, IBC Tripura Chapter delivered speech and detailed about the activities of IBC Tripura Chapter and appealed for continuing such type of joint venture programme in future too by these two Chapters of IBC. Er. C. Debnath, Vice President IBC spoke on the occasion. He mentioned about the IBC HQ and also the Chapter activity. He urged upon the engineers to take membership of IBC and also requested the Chapter to conduct the technical activity regularly. He met with Er. Raj Chakraborty, Commissioner cum Spl. Secretary, PWD (Bldg & NH) at his chamber at Secretariat Dispur and urged upon to support in the activities of IBC.

During discussion Er. C. Debnath brought into the notice of Er. Raj Chakraborty that PWD Assam Govt. is the Institutional Member of IBC. Er. Debnath requested the Commissioner cum Spl. Secretary for issuing a letter for engineers working under PWD Assam to join IBC by becoming members of IBC which he agreed. Er. Debnath also appealed to the Commissioner to provide two rooms in the PWD complex for functioning of IBC Assam Chapter which he agreed. Commissioner also expressed his view that after formation of Chapter in all the North Eastern States, a special programme can be initiated on “Infrastructure development in North Eastern Region of India” with the involvement of IBC Chapter in all 8 N.E. States, Building deptts. NEC to be conducted at Guwahati or Shillong. Two presentations on the topic 'Retrofitting of Structure' were made by Er. Kapil Baran Bhowmik, Retd. Dy. General Manager, HUDCO Ltd. Agartala and Ar. Amal Barman, Dy Architect PWD (Building), Assam.

Thirteen (13) Engineers/Architects applied for membership of IBC and thus the number of IBC members of Assam State become 67.

The Committee of IBC Assam Chapter was formed with members as under:-

Chairman – Er. Hiren Das, Chief Engineer (Bldg.); Vice Chairman - Er. Bhupendra Ch. Sarma, Spl. Chief Engineer, (Health & Edn.); Hony Secretary Er. Pulak Sarmah, ACE (Irrigation); Treasurer – Er. Mahendra Mohan Das, ACE (Building); Executive Members- Er. Dilip Deka, Former ACE, (Irrigation), Er. Chandana Basumatary, SE, (Building), Er. Arjun Ch. Mandal, SE (Building), Ar. Amal Barman, Dy. Architect (Building), Er. Banu Arifa Khanam, EE (Building).

Er. C. Debnath, Vice President, IBC congratulated the New Committee. The Chairman and Hony. Secretary Er. Hiren Das, CE, PWD (Bldg.) and Er. Pulak Sarmah, Addl CE, (Irrigation) delivered their speeches. The Programme concluded with the vote of thanks offered by newly elected committee member & programme Co-ordinator Er. Banu Arifa Khanam, EE, PWD (Bldg.), Assam.

## Nagaland State Chapter-Kohima Committee Meeting



Dignitaries on the Dais

A special meeting of IBC Nagaland Chapter along with joint venture programme with IBC Tripura Chapter was held on Nov. 23, 2023 at the Conference Hall of PWD, Govt. of Nagaland at Kohima. The meeting was chaired by Er. (Ms.) Olemchila I. Yaden, EE, PWD (Housing). A seminar on “Retrofitting of Structure” was organised jointly with IBC, Tripura Centre.





Shri Hozheto Shiku, Chief Engineer (Housing) PWD, Nagaland delivering the Welcome Address

At the beginning, Er. Hozheto Shiku, Chief Engineer (Housing) PWD, Nagaland and also Hony. Secretary, IBC Nagaland Chapter delivered the Welcome Address and briefed about the background of this special meeting. He mentioned that at the initiation of Er. C. Debnath, Vice President, IBC, New Delhi, this programme was organised with the support of PWD, Govt. of Nagaland with special purpose of membership drive of IBC, formation of IBC committee of Nagaland Chapter and Joint venture seminar programme. He welcomed all in the meeting, specially the delegates of IBC Tripura Chapter.



Shri M.S. Roy, Fmr. Chief Engineer, ONGC delivering speech

Er. M.S. Roy, Chairman, IBC Tripura Chapter delivered speech and detailed about the activities of IBC Tripura Chapter.

Er. C. Debnath, Vice President, IBC spoke on the occasion. He mentioned about the IBC HQ and also the Chapter activity. He urged upon the engineers to take membership of IBC and also requested the Chapter to conduct the technical activity regularly. He also appreciated the Nagaland PWD for conducting the National Executive Committee meeting of IBC in the month of June, 2022 at Kohima. He also requested the Engineer-in-Chief, PWD for providing two rooms in PWD complex for functioning of IBC Nagaland Chapter.



Shri Pukroneizo Kera, E-in-C, PWD Nagaland delivering the Speech

Er. Pukroneizo Kera, Engineer-in-Chief, PWD Nagaland delivered his speech. He assured all support to IBC from PWD Nagaland and also announced to provide two rooms for IBC in the PWD complex which was shown to the Vice President after the programme. Two presentations was made by Er. Kapil Baran Bhowmik, Fmr. Dy. G.M., HUDCO Ltd., Agartala and Er. Chengato Kath, EE, PWD (Housing), Nagaland.



Newly Elected Committee of Nagaland Chapter

Thirteen 13 engineers applied for membership of IBC and thus, the number of member of IBC belonging to Nagaland State Chapter become 63.

The proposal for formation of Adhoc Committee of IBC Nagaland Chapter was prepared for forwarding to IBC Headquarters for approval.

Er. Pukroneizo Kera, Engineer-in-Chief, PWD and Hony. Secretary Er. Hozheto Shiku, Chief Engineer, PWD (Housing) delivered their speeches. The programme concluded with the vote of thanks offered by Er. (Ms.) Olemchila I. Yaden, EE, PWD Nagaland.

## National News

### A Temple being built to last ages - Ram Temple



Ram Temple under construction

Ram Temple at Ram Janmabhoomi in Ayodhya, the first phase of the project is almost ready. It's a Nagara-style temple, designed by a team under well-known architect Chandrakant Bhai Sompura.

Temple is based on Nagara Style of Architecture. 'Nagara' is a distinct style of temple architecture that emerged in northern India from the 5th century CE onward. Temples of this type usually don't have elaborate boundary walls or gateways and the sanctum sanctorum is always located directly under the tallest tower. The entire temple is usually built on a stone platform with steps leading up to it. All these features can be found in the new Ram Temple at Ayodhya.

The temple is primarily built of pink sandstone and carved marble from Mirzapur and Bansi-Paharpur in Rajasthan. Besides, 17,000 granite stones, each weighing 2 tonnes, have been used in it. "So far, 21 lakh cubic feet of granite, sandstone and marble has been used in the

construction of the temple," says Champat Rai, General Secretary of Shri Ram Janmabhoomi Teerth Kshetra Trust.

### Built for Eternity

On experts' advice, steel and ordinary cement have not been used in the temple's construction. The foundation, laid after consultations with IIT Chennai, is 12m deep. The soil used for refilling the foundation can get converted into stone in 28 days, and a total of 47 layers were laid in the foundation. Rai says the temple will not require any repairs for at least 1,000 years and even a 6.5 magnitude earthquake won't be able to shake its foundation.

### 2 More Phases to Go

Construction committee chairman Shri Nripendra Misra had set a December 15, 2023 deadline for completing the first phase – the ground floor where the sanctum sanctorum is situated.

The second phase, including the first and second floors, all the murals and iconography work, lower plinth and engraving on around 360 massive pillars, will be finished by December 2024. The first floor will have the Ram Darbar, and each pillar will have 25-30 figures carved on it. Seven temples of Maharishi Valmiki, Vishwamitra, Nishad, Shabri, etc, will also be built outside the parkota (outer wall) next year.

In the third phase, the 71-acre site, including auditoriums and the parkota that has bronze murals and temples of Saptarishis, etc, will be completed by December 2025.

### Ram Idol an Enigma

Before the January 22, 2024 consecration ceremony, the temple trust will select one of the three idols of Ram Lalla (5-year-old deity) being carved in secrecy at three different locations in Ayodhya. The chosen idol will be installed in the sanctum sanctorum in the presence of PM Narendra Modi, and the public will be able to have darshan of the deity after the morning of January 27.

The three sculptors of the Ram Lalla idols were invited to Ayodhya along with their choice of stone. While one brought white Makrana marble, the other two brought a greyish stone from Karnataka that's popularly known as Krishna Shila.



These and all other types of stones meant for idols were tested at the government's National Institute of Rock Mechanics. Only then the sculptors were asked to start work.

Another optical highlight of the temple is a system to divert and reflect sunlight on the idol's forehead at 12 noon on every Ram Navami. It has been designed by the Central Building Research Institute in Roorkee and the Inter University Centre for Astronomy and Astrophysics, Pune.

### India's First Autonomous Car

Minus Zero, a Bengaluru-based artificial intelligence (AI) startup, has unveiled zPod, which it says is the country's first self-driving car.

The vehicle does not have a steering wheel. Instead, it navigates through traffic with the help of strategically-placed high-resolution cameras.



Self Driving Car

With true vision autonomy coming to the fore, one can make autonomous vehicles a reality, solving major pain points of the mobility paradigm.

Here is all you need to know about Minus Zero's z Pod:

- Arguably the most unique highlight of the 4-wheeler is that it does not have a steering wheel. Instead, strategically-placed high-resolution cameras help it analyse driving conditions, including traffic.
- A camera-sensor suite captures the vehicle's surroundings, which it shares with the embedded AI system. The AI, in turn, processes the information through images to help zPod avoid obstacles, control

its speed, and stop.

- Minus Zero claims that zPod can be scaled up to 'Level 5' autonomy, the highest for a self-driving car. This level of autonomy means that the vehicle does not need human intervention to operate.
- As of now, zPod is 'good enough' to be used within an enclosed and controlled area such as a campus or large residential complexes.

### PM Modi Inaugurates New ITPO Complex 'Bharat Mandapam'

Prime Minister Narendra Modi on July 26, 2023 inaugurated the new International Exhibition-cum-Convention Centre (IECC) complex 'Bharat Mandapam' in Delhi.



Prime Minister Narendra Modi inaugurated the India Trade Promotion Organisation complex 'Bharat Mandapam' at Pragati Maidan in New Delhi

An official statement said that the project, which revamped the old and outdated facilities at Pragati Maidan, was developed as a National project at a cost of about ₹2700 crore. With a campus area of approximately 123 acres, the IECC complex has been developed as India's largest MICE (Meetings, Incentives, Conferences, and Exhibitions) destination.

The newly developed IECC complex at Pragati Maidan comprises multiple state-of-the-art facilities including Convention Centre, Exhibition halls, amphitheatres etc.





Prime Minister Narendra Modi performs 'Puja' at the redeveloped International Exhibition-cum-Convention Centre (IECC) complex at Pragati Maidan

The release said, "The Convention Centre is developed as the centrepiece of the Pragati Maidan complex. It is a grand architectural marvel, designed to host large-scale international exhibitions, trade fairs, conventions, conferences, and other prestigious events. It is equipped with multiple meeting rooms, lounges, auditoriums, an amphitheatre and a business centre, making it capable of hosting a wide range of events."

Its majestic multi-purpose hall and plenary hall have a combined capacity of seven thousand people, which is larger than the seating capacity of the famous Sydney Opera House in Australia. Its magnificent Amphitheatre is equipped with a seating capacity of 3,000 individuals.

The architectural design of the Convention Centre building is inspired by Indian traditions and showcases India's confidence and conviction in its past while also embracing modern facilities and way of life. The release also said that the shape of the building is derived from the Shankha (conch shell), and different walls and facades of the Convention Centre depict several elements of India's traditional art and culture.

Other facilities available in the Convention Centre include a 5G-enabled fully Wi-Fi-covered campus, 10G Intranet connectivity, an interpreter room equipped with cutting-edge technology to support 16 different languages, advanced AV systems with huge-sized video walls, building management system ensuring optimal functionality and energy efficiency, light management system with dimming and occupancy sensors, state-of-the-art DCN (Data Communication Network) system, integrated surveillance system and energy-efficient centralized air conditioning system.

## India's Photovoltaic potential amidst Air Pollution and Land Constraints

Only 29% of India's landmass has good photovoltaic potential or ability of harness solar power, while most parts of the region in northern India, including Delhi, are worst hit due to aerosol loading or excessive particles in air causing air pollution, found a study by IIT Delhi. The study also found that about 0.2% of the country's area, of which a major part is in northern India, is losing out its photovoltaic potential, which could be about 50GW of solar energy per year.

While India has an ambitious solar power generation programme, related projects must be implemented after assessing the region's air quality and other factors that impact photovoltaic potential, authors of the study asserted.



Most parts of the region in northern India, including Delhi, are worst hit due to aerosol loading or excessive particles in air

The study was published in the Journal *iScience*. It was done by Sushovan Ghosh; Alok Kumar, Dilip Ganguly and Sagnik Dey from Centre for Atmospheric Sciences, IIT Delhi.

The study used satellite derived data over the Indian region to assess that "surface insolation over India has been decreasing between 2001 and 2018".

"Every year, India is missing out on certain watts that could have been generated over an area. For this, aerosol is the main factor," said Sushovan Ghosh, the lead author of the study. He further pointed out that according to the study, one cannot put a solar panel anywhere simply based on the land availability. People will have to count the solar potential as well.

"We remapped photovoltaic potential in India to find

that only 29% of India's whole landmass is suitable for effective solar power generation,” said Ghosh.

The study further revealed that even that landmass is shrinking.

“Only 29.3% of the Indian landmass is presently suitable for effective solar photovoltaic harnessing, but this is further declining by 0.2% annually, causing a presumptive loss of 50GW solar potential, translating 75 TWh power generation. Lowering two decades of aerosol burden can make 8% additional landmass apt for photovoltaic use. Alleviating aerosol-induced dimming can fast-track India's solar energy expansion,” stated the study.

It further asserted that solar resources over nearly 98% of Indian landmass are “significantly affected by aerosols”, while 40% by clouds and 39% by both aerosols and clouds.

“In future, under any policy, one must keep in mind the environment and then go ahead with the project of solar energy. The cleaner air will bring more benefits,” said Ghosh.

The study warned that the 29% area could go up to 37% if aerosol loading was not brought down. “The 29% of landmass is mainly expanding over the western, some part of north and mostly southern India – which means that southern and western regions have more potential,” said Ghosh, adding that the same is less in north-western regions, including Delhi.

“If we get rid of the last decade of aerosol loading, then states along the Indo-gangetic plain like Delhi, UP, Odisha, Jharkhand, Bihar etc., will pop up as states with high photovoltaic potential. Due to aerosols, they are missing out on the potential of the sun.”

## अब टूटे हुए कांच को जोड़ना होगा आसान

अब ग्लास युक्त उपकरण सहित एयर क्राफ्ट में लगाए जाने वाले टूटे कांच को जोड़ना आसान होगा। लखनऊ विश्वविद्यालय के भौतिक विज्ञान विभाग में इस पर शोध किया गया है। एसोसिएट प्रोफेसर डा. सी.आर. गौतम के साथ शोधार्थी जायरीन, श्वेता, सर्वेश अवनाशी व रजत मिश्रा ने यह शोध किया है। हाल ही में सिंगर के एप्लाइड फिजिक्स ए नामक अंतरराष्ट्रीय जर्नल में यह शोध प्रकाशित हुआ है।

डा. सी. आर. गौतम ने बताया कि बुलेटप्रूफ सहित कांच विभिन्न प्रकार के होते हैं। कुछ का गलन तापमान अधिक तो कुछ का कम होता है। अभी तक टूटे कांच को जोड़ने के लिए किसी चिपकाने वाले पदार्थ का प्रयोग किया जाता है, लेकिन ज्यादा तापमान पर काम नहीं करते और टूट जाते हैं। शोध के माध्यम से ऐसा पदार्थ तैयार किया गया है जिससे कांच मजबूती से जुड़ सके। कांच को अकार्बनिक पदार्थ को मिलाकर बनाया जाता है जो आक्साइड मटीरियल के रूप में होता है।

## प्लास्टिक कचरा से बनाया अग्निरोधी बोर्ड



कानपुर के रनियां क्षेत्र स्थित फैक्ट्री में बोर्ड तैयार करता कर्मी

प्लास्टिक का कचरा पर्यावरण के लिए बड़ा खतरा है। इसके निस्तारण के लिए प्रयास जारी हैं। इसी क्रम में आई.आई.टी., कानपुर के सहयोग से नवोन्मेष किया गया है, जो प्लास्टिक के उस कचरे का निस्तारण करता है, जिसे कबाड़ी भी लेने से इन्कार कर देते हैं। आई.आई.टी., कानपुर में इन्क्यूबेटेड कंपनी नोवोअर्थ ने प्लास्टिक के कचरे से अग्निरोधी बोर्ड तैयार किया है जिसका व्यावसायिक उपयोग आरंभ हो चुका है। केंद्रीय विभाग से प्रोत्साहन के साथ इस बोर्ड को लकड़ी विज्ञान एवं प्रौद्योगिकी संस्थान से भी प्रमाणन मिल चुका है।



सार्थक गुप्ता, सह संस्थापक, नोवाअर्थ

**पानी में भी नहीं होता खराब:** इस नवोन्मेष से तैयार किया गया हार्ड बोर्ड अग्निरोधी होने के साथ ही पानी में डूबे रहने पर भी खराब नहीं होता। इसे तैयार करने में चिप्स और बिस्कुट के पैकेट, दूध-लस्सी और शीतल पेय के बहुस्तरीय ट्रेटापैक और प्लास्टिक की बेकार हो चुकी बोरियों का भी प्रयोग किया गया है। यह बोर्ड भवन निर्माण में प्रयुक्त होने वाली शटरिंग का सर्वश्रेष्ठ विकल्प है। इससे विद्यालयों के लिए डेस्क-बेंच भी बनाई जा रही हैं। यह नवोन्मेष रोजगार सृजन में भी सहायक है और लकड़ी के बोर्ड का विकल्प बनकर पेड़ों की कटाई भी कम करने में भूमिका निभाएगा।

**50 लाख रुपये का सरकारी अनुदान:** बोर्ड बनाने का फार्मूला

मैकेनिकल इंजीनियर श्री सार्थक गुप्ता ने अपने मित्र शाहिद जमाल के साथ तैयार किया है। नवोन्मेष को सराहते हुए केंद्र सरकार के जैव प्रौद्योगिकी विभाग ने ५० लाख रुपये का अनुदान जारी किया, जिसके बाद उत्पादन को गति मिली। 'सार्थक गुप्ता के अनुसार, कानपुर में प्लास्टिक के कचरे की समस्या को देखकर इसके निस्तारण का विचार आया। दिल्ली विश्वविद्यालय के श्रीराम इंस्टीट्यूट फार इंडस्ट्रियल रिसर्च में एक वर्ष तक प्लास्टिक निर्माण पर शोध किया। जिसमें पता चला कि खाने-पीने की वस्तुओं की पैकिंग में प्रयोग होने वाले प्लास्टिक के कचरे का कहीं भी दोबारा प्रयोग नहीं हो रहा है। इस नवोन्मेष के बारे में आई.आई.टी., कानपुर के प्रोफेसर अमिताभ बंदोपाध्याय कहते हैं कि प्लास्टिक के कचरे का निस्तारण बड़ी समस्या है।

नवोन्मेष से प्लास्टिक के ऐसे कचरे का दोबारा प्रयोग संभव है जो अभी प्रदूषण ही बढ़ाता था। मुंबई की कंपनी के साथ करार किया गया है।

## International News

### Musical Road

A musical road is a road, or section of a road, which when driven over causes a tactile vibration and audible rumbling that can be felt through the wheels and body of the vehicle. This rumbling is heard within the car as well as the surrounding area, in the form of a musical tune. Musical roads are known to currently exist in Hungary, Japan, South Korea, the United States, China, Iran, Taiwan, Indonesia and the United Arab Emirates. In the past, they could be found in France, Denmark and the Netherlands as well.

Each note is produced by varying the spacing of strips in, or on, the road. For example, an E note requires a frequency of around 330 vibrations a second. Therefore, strips 2.4 in (61 mm) apart will produce an E note in a vehicle travelling at 45 mph (72 km/h).

### Denmark

The first known musical road, the Asfaltofon (English: Asphaltophone), was created in October 1995 in Gylling, Denmark, by Steen Krarup Jensen and Jakob Freud-Magnus, two Danish artists. The Asphaltophone was made from a series of raised pavement markers, similar to Botts' dots, spaced out at intermittent intervals so that as a vehicle passed over the markers, the vibrations caused by the wheels could be heard inside the car. The song played was an arpeggio in the key of F major.

### France

In 2000, a musical road with a 28-note melody composed by Gaellic Guillerme was built in the suburb of Villepinte, Seine-Saint-Denis, France. It was located on boulevard Laurent and Danielle Casanova and was supposedly paved over in 2002. However, as of 2006, subsequent visits to the site of this musical road claimed that the song could still be heard faintly.

### Hungary

In 2019, Hungary installed a musical road in memoriam of László Bódi (better known by his stage name Cipő), lead singer from the band Republic. When going on the side of the road, one can hear an approximately 30-second snippet of their song 67-es út (Road 67). It is located at 46.530547°N 17.817368°E on Road 67 between Mernyeszentmiklós and Mernye, in the southbound direction.

### Indonesia

In 2019, Indonesia installed a musical road along the Ngawi–Kertosono section of the Solo–Kertosono Toll Road in Java. The song played is the first six notes of "Happy Birthday To You," but the fifth note is off-key by a half-step. It was installed to reduce the number of traffic accidents, and the song was chosen because it is familiar to the community.

### Japan

In Japan, Shizuo Shinoda accidentally scraped some markings into a road with a bulldozer and drove over them and realized that it was possible to create tunes depending on the depth and spacing of the grooves. In 2007, the Hokkaido National Industrial Research Institute, which had previously worked on a system using infra-red lights to detect dangerous road surfaces, refined Shinoda's designs to create the Melody Road. They used the same concept of cutting grooves into the concrete at specific intervals and found the closer the grooves are, the higher the pitch of the sound; while grooves which are spaced farther apart create lower pitched sounds.

There are multiple permanently paved 250-meter (820 ft) Melody Roads sections throughout Japan. The first ones built included one in Hokkaido in Shibetsu, Nemuro which plays the "Shiretoko Love Song" on the





Musical Road

site of where Shinoda's first bulldozer scrapings were, another in the town of Kimino in Wakayama Prefecture where a car can produce the Japanese ballad "Miagetogoranyoru no hoshi wo" by Kyu Sakamoto, one in Shizuoka Prefecture on the ascending drive to Mount Fuji, and a fourth in the village of Katashina in Gunma, which consists of 2,559 grooves cut into a 175-meter (574 ft) stretch of existing roadway and produces the tune of "Memories of Summer". A 320-meter (1050 ft) stretch of the Ashinoko Skyline in Hakone plays "A Cruel Angel's Thesis", the theme song from the anime Neon Genesis Evangelion, when driven over at 40 km/hr. Yet another can be found on the road between Nakanajo town and Shima Onsen, which plays "Always With Me" (Japanese title: いつも何度でも, Itsumonando demo) from the feature animation Spirited Away.

The roads work by creating sequences of variable width groove intervals to create specific low and high frequency vibrations. Some of these roads, such as one in Okinawa that produces the Japanese folk song "FutamiJowa", as well as one in Hiroshima Prefecture, are polyphonic, with different sequences of rumble strips for the left and right tires so that a melody and harmony can be heard. As of 2016, there are over 30 Melody Roads in Japan.

## Netherlands

A singing road had been installed near the village of Jelsum in Friesland. The Friesland provincial anthem (De Alde Friezen) would play if drivers obeyed the speed limits, otherwise the song would play off-key. After complaints from villagers, the singing road was removed.

## South Korea

The Singing Road can be found close to Anyang,

Gyeonggi, South Korea, and was created using grooves cut into the ground, similar to the Japanese Melody Roads. Unlike the Japanese roads, however, which were designed to attract tourists, the Singing Road is intended to help motorists stay alert and awake – 68% of traffic accidents in South Korea are caused by inattentive, sleeping or speeding drivers. The tune played is "Mary Had a Little Lamb" and took four days to construct. It is likely that the song was chosen because the road leads to an airport - in Korean, the melody of "Mary Had a Little Lamb" is known as "Airplane," with lyrics describing an airplane flying. As of 2022, however, it was paved over and the song can no longer be heard.

As of 2022, there are five singing roads in South Korea. There were formerly six, but the first was paved over. The second one, built at an unknown date, plays a traditional folk tune called "Mountain Wind, River Wind" for guests exiting the ski resort Kangwonland. The third is located on the way from Osan to Chinhae and plays a song called "Bicycle."

The fourth was constructed in 2019 and plays the first verse of "Twinkle Twinkle Little Star". It was constructed inside of the Inje-Yangyang Tunnel on the Seoul-Yangyang Expressway, the longest tunnel in Korea. The fifth is located on the Donghae Expressway inside of a tunnel and plays a well-known Korean children's folk song called "Cheer Up, Dad." The sixth one was constructed inside the Marae tunnel on route 17, but the title of the song played by the road is unknown.

## China

A 300-meter stretch of asphalt road in Beijing's southwestern Fengtai district in the Qianlingshan Mountain Scenic Area has been made into a singing road and will play the tune "Ode to the Motherland", as long as drivers follow the speed limit of 40 km/h. Construction was completed in 2016. "We have small grooves built into the road surface, positioned apart with different sizes of gap according to the melody of the song. These 'rumble strips' cause the car tires to play music and then make a singing road," said Lin Zhong, general manager of Beijing LuxinDacheng landscape architecture company. "Our first idea is to get cars moving at a constant speed. Because only in that way can you enjoy good musical effect. We use it as a reminder of speed limit," added Lin.

Two other musical roads in China exist: the first at a

nature reserve in Henan that plays the national anthem and "Mo Li Hua", and the second near Yangma Dao in Yantai which plays the overture from "Carmen" and "Ode to Joy". One song is paved into each side of the road at both locations so drivers can experience a song both traveling one way and the other way.

In June 2021, a 587-meter portion of G108 in Xiayunling Township, Fangshan, Beijing, was made into a musical road which plays the tune of Without the Communist Party, There Would Be No New China. Xiayunling was the birthplace of this song.

## United States

The Civic Musical Road was built on Avenue K in Lancaster, California, on 5<sup>th</sup> September 2008. Covering a quarter-mile stretch of road between 60<sup>th</sup> Street West and 70<sup>th</sup> Street West, the Civic Musical Road used grooves cut into the asphalt to replicate part of the finale of the William Tell overture. It was paved over on 23<sup>rd</sup> September after nearby residents complained to the city council about noise levels. After further complaints from city residents about its removal, work began to re-create it on 15 October 2008 on Avenue G between 30<sup>th</sup> Street West and 40<sup>th</sup> Street West-this time, two miles away from any residence. This road is named after the Honda Civic. It opened two days later. The new section on Avenue G is only in the far left lane of the westbound side of the road. The road appears in Honda Civic commercials. The rhythm is recognizable, but the intervals are so far off that the melody bears only a slight resemblance to the William Tell overture, regardless of the car speed. It is likely the designers made a systematic miscalculation not to include the width of the groove in the relevant width of the spacing plus groove. This failure was made on both Avenue K and Avenue G.

In October 2014, the village of Tijeras, New Mexico, installed a musical road on a two-lane stretch of U.S. Route 66 which plays "America the Beautiful", when a vehicle drives over it at 45 mph. This highway is labelled NM 333, between Miles 4 and 5, eastbound. Funded by the National Geographic Society, the project was coordinated with the New Mexico Department of Transportation who described the project as a way to get drivers to slow down, "and to bring a little excitement to an otherwise monotonous highway." By 2020, however, the tune was fading and most of the ridges were even

paved over. A spokesperson for New Mexico's Department of Transportation said, "...there are no plans to restore the musical highway. The cost is outrageous, and they have since restored portions of the roadway and removed all of the signs. Unfortunately, this was part of a previous administration and never set in stone to keep up with the maintenance of this singing highway."

In October 2019, Tim Arnold, an alumnus of Auburn University's College of Engineering, created and installed a musical road that plays the first seven notes of the Auburn Tigers fight song, "War Eagle". Inspired by previous musical roads, the short section of South Donahue Drive has been dubbed "War Eagle Road" and was created with a revolutionary process utilizing a surface-application material which does not damage the road. Working with support from Auburn University and the National Center for Asphalt Technology, Arnold developed the War Eagle Road to be a work of public art welcoming fans and rivals as they approach campus. The project was approved by Office of the University Architect within Facilities Management and completed to coordinate with the final three home games of the Auburn Tigers football season. The musical road has enjoyed a positive public reaction and seems to be welcomed as a permanent fixture.

## United Arab Emirates

On January 13, 2023, a musical road was built in the city of Al Ain in the United Arab Emirates, playing the national anthem of the country, *Ishy Bilady*, when driven over. However, it is being used as an experiment; the strips on the road are temporary and will be removed in the future to study the possibility of a better implementation.

*Note: Authors has drawn references from a no. of publications/articles which are not being enumerated.*

## Fog Harvesting

Fogs have the potential to provide an alternative source of fresh water in dry regions and can be harvested through the use of simple and low-cost collection systems. Captured water can then be used for agricultural irrigation and domestic use. Research suggests that fog collectors work best in locations with frequent fog periods, such as coastal areas where water can be harvested as fog moves inland driven by the wind. However, the technology could also potentially supply

water in mountainous areas if the water is present in stratocumulus clouds, at altitudes of approximately 400 m to 1,200 m (UNEP, 1997b). According to the International Development Research Centre (1995), in addition to Chile, Peru, and Ecuador, the areas with the most potential to benefit include the Atlantic coast of southern Africa (Angola, Namibia), South Africa, Cape Verde, China, Eastern Yemen, Oman, Mexico, Kenya, and Sri Lanka.

Fog harvesting provides an alternative source of freshwater through a technique used to capture water from wind-driven fog. Fog harvesting systems are typically installed in areas where the presence of fog is naturally high, typically coastal and mountainous regions. The systems are usually constructed in the form of a mesh net, stabilized between two posts that are spread out at an angle perpendicular to the prevailing wind carrying the fog. As the wind passes through the mesh, drops of freshwater form and drip into an underlying gutter, from which pipes lead the water into a storage tank.

Fog harvesting technology consists of a single or double layer mesh net supported by two posts rising from the ground. Mesh panels can vary in size. The ones used by the University of South Africa in a fog harvesting research project measured 70 m<sup>2</sup> whereas in the Yemen, a set of 26 small Standard Fog Collectors (SFC) of 1 m<sup>2</sup> were constructed. The material used for the mesh is usually nylon, polyethylene or polypropylene netting (also known as 'shade cloth') which can be produced to various densities capable of capturing different quantities of water from the fog that passes through it (UNEP, 1997b). The collectors are positioned on ridgelines perpendicular to prevailing wind and capture and collect water when fog sweeps through. The number and size of meshes chosen will depend on the local topography, demand for water, and availability of financial resources and materials. According to Fog Quest the optimal allocation is single mesh units with spacing between them of at least 5 m with additional fog collectors placed upstream at a distance of at least ten times higher than the other fog collector. In South Africa, the University research project arranged several mesh panels together in order to expand the water catchment area and provide greater stability to the structure in windy conditions.

The collector and conveyance system functions due to gravity. Typical water production rates from a fog collector range from 200 to 1,000 litres per day, with variability occurring on a daily and seasonal basis (Fog Quest). Efficiency of collection improves with larger fog droplets, higher wind speeds, and narrower collection fibres/mesh width. In addition, the mesh should have good drainage characteristics. Water collection rates from fog collectors are shown in Table 1 below.

**Table 1: Water Collection Rates from Fog Collectors**

Project	Total collecting surface (m <sup>2</sup> )	Water collected (liters/day)
University of South Africa	70	3,800
Yemen	40	4,500
Cape Verde	200	4,000
Dominican Republic	40	4,000
Eritrea	1,600	12,000

Sources: UNISA, 2008; Schemenauer et al, 2004; Washtechology; Fog Quest

The dimensions of the conveyance system and storage device will depend on the scale of the scheme. Storage facilities should be provided for at least 50 per cent of the expected maximum daily volume of water consumed. For agricultural purposes, water is collected in a regulating tank, transferred to a reservoir and then finally into an irrigation system that farmers can use to water their crops (UNEP, 1997b). Operation and maintenance are relatively simple processes once the system has been properly installed.

Drought caused by climate change is leading to reductions in the availability of fresh water supplies in some regions. This is having an impact on agricultural production by limiting opportunities for planting and irrigation. Fog harvesting provides a way of capturing vital water supplies to support farming in these areas. Furthermore, when used for irrigation to increase forested areas or vegetation coverage, water supplies from fog harvesting can help to counteract the desertification process. If the higher hills in the area are planted with trees, they too will collect fog water and contribute to the aquifers. The forests can then sustain themselves and contribute water to the ecosystem helping to build resilience against drier conditions.



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4	ML-9675	Shri Rishi Kumar Verma	B.Tech. (Civil)	Own Practice	R.K. Verma & Associates	Jalandhar	Punjab
5	ML-9676	Shri Vinay Kumar	B.E.	Executive Engineer	MES	Hamirpur	Himachal Pradesh
6	ML-9677	Shri Rahul Bagadi	B.Tech. (Civil)	Assistant Engineer	Rajasthan PWD	Kota	Rajasthan
7	ML-9678	Shri Revti Raman Sharma	B.Tech.	Junior Engineer	Rajasthan PWD	Kota	Rajasthan
8	ML-9679	Shri Sunil Pareta	B.Tech.	Assistant Engineer	Rajasthan PWD	Kota	Rajasthan
9	ML-9680	Shri Abhishek Gurjar	B.E. (Civil)	Junior Engineer	Rajasthan PWD		Rajasthan
10	ML-9681	Shri Om Prakash Verma	B.E. (Civil), ME (Water Resources)	Chief Engineer	UIT KOTA	Kota	Rajasthan
11	ML-9682	Shri Ram Dayal Meena	B.E. (Civil)	Executive Engineer	Rajasthan PWD	Jaipur	Rajasthan
12	OM-9683	Shri Sonu Nagar	B.Tech.	Junior Engineer	Rajasthan PWD	Bundi	Rajasthan
13	ML-9684	Shri Lakshmi Narayan Bairwa	B.Tech.	Junior Engineer	Rajasthan PWD	Jaipur	Rajasthan
14	ML-9685	Shri Keval Ramendra Parikh	B.E. Civil, M.S. (USA)	Director	RJP Infrastructure Pvt. Ltd.	Ahmedabad	Gujarat
15	ML-9686	Shri Krunal Shah	B.E. (Elect.), MBA	Proprietor	One Stop Solutions	Ahmedabad	Gujarat
16	ML-9687	Shri Dharmendra Kumar Gajjar	C.D. & EST, DCE, L.S, G.D.	Dy. Director (Plg.)		Ahmedabad	Gujarat
17	ML-9688	Shri Amit Kumar	Master in Town Planning		DDA	New Delhi	Delhi
18	ML-9689	Shri Satish Kumar Singhal	B.E. (Civil)	Executive Engineer	Rajasthan PWD	Sawai Madhopur	Rajasthan
19	ML-9690	Shri Shubham Jain	B.Tech.(Civil)	Assistant Engineer	Rajasthan PWD	Bundi	Rajasthan

S.No.	M.No.	Name	Qualification	Designation	Department	City	State
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33	ML-9704	Shri Nabam Takar	B.Tech., MBA	Executive Engineer	Arunachal Pradesh PWD		Arunachal Pradesh
34	ML-9705	Shri Nani Chailang	B.E. (Civil)	Superintending Engineer	Arunachal Pradesh PWD	Itanagar	Arunachal Pradesh
35	ML-9706	Ms. Sita Debia	B.Tech. (Civil)	Assistant Engineer	Water Resources Department		Arunachal Pradesh
36	ML-9707	Shri Ratan Jacob	B.E. (Civil)	Junior Engineer	PHE & WS Department		Arunachal Pradesh
37	ML-9708	Shri G. Muthuramalingam	Diploma in Civil Engg	Assistant Engineer	Arunachal Pradesh PWD		Arunachal Pradesh
38	ML-9709	Shri Tejom Jini	B.E. (Civil)	Junior Engineer	Arunachal Pradesh PWD		Arunachal Pradesh
39	ML-9710	Shri Girish Chandra Srivastava	Diploma in Civil Engineer	Junior Engineer	Arunachal Pradesh PWD	Itanagar	Arunachal Pradesh
40	ML-9711	Ms. Namita Tamrakar	Master of Urban Planning	Urban Planner	Freelancing Work	Durg	Chhattisgarh

S.No.	M.No.	Name	Qualification	Designation	Department	City	State
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42	ML-9713	Shri Ankush Shrivastava	B.E. (Civil)	Consulting Engineer	H.A.A. Associates	Durg	Chhattisgarh
43	ML-9714	Shri Shubham Yadav	B.E.(Civil), M.Plan (Urban Planning)	Asst. Prof., HoD (I/C)	CSVTU	Bastar	Chhattisgarh
44	ML-9715	Ms. Kritika Chandrakar	B.Tech. (Civil), Interior Designer	Interior Designer		Durg	Chhattisgarh
45	ML-9716	Shri Indrajeet Singh Sehgal	Diploma in Civil Engg.	Civil Engineer/ Designer	CAD Academy	Durg	Chhattisgarh
46	ML-9717	Shri Arvind Dhakulkar	Architect		Arvind & Architects	Durg	Chhattisgarh
47	ML-9718	Shri Arvind Kumar Tamrakar	Diploma in Civil Engg.	Founder	A4 Architects	Durg	Chhattisgarh
48	ML-9719	Shri Suraj Kumar Gupta	B.E. (Chemical)	Self Employed		Durg	Chhattisgarh
49	ML-9720	Shri Bimendra Kumar Deshmukh	B.E. (Civil)	Self Employed		Durg	Chhattisgarh
50	ML-9721	Shri Hari Narayan Dewangan	B.E. (Civil)	Engineer	SD Associate	Raipur	Chhattisgarh
51	OM-9722	Shri Akshay Kumar Sahu	B.Tech.(Civil)	Draftman	Civil Technical Solution		Chhattisgarh
52	OM-9723	Shri Nehil Hariharno	B.E. (Civil)	Civil Engineer	Civil Technical Solutions		Chhattisgarh
53	ML-9724	Ms. Nainika Kasliwal	M.Tech.(Env.& Energy), B.E. (Civil)		Sanjeev Kasliwal & Associates	Durg	Chhattisgarh
54	ML-9725	Shri Satish Kumar Tamrakar	A.M.I.E. (Civil Engg.)	Assistant Engineer	Panchyat & Rural Department	Bhilai	Chhattisgarh
55	ML-9726	Shri Santosh Kumar Tamrakar	B.E. (Civil)	Former Executive Engineer	Water Resources Department	Durg	Chhattisgarh

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3	IM-90217	Shri Amar Kumar	B.E. Civil Engineering	Senior Executive	M/s Urbanaac Infrastructures Pvt. Ltd.	Ahmedabad	Gujarat



## From Editor-in-Chief Desk

Human Resource Development (HRD) is the domain that performs core function in an organisation for the advancement of personal and professional skills and abilities of employees. HRD includes such opportunities as employee training, employee career development, performance management and development, coaching, mentoring, key employee identification and organisational development. HRD has the key role in improving knowledge and skills of human resource in any organisation. The main target of human resource development is on streamlining the workforce and employers so that the company as well as employees can achieve their work goals and objectives to maximum satisfaction of all stakeholders. The companies should implement a planned progress of development of human resource and actively support their employees in the voluntary development of their skills.

Organisations have many opportunities for human resource development, both within and outside the workplace. Human resource development can be both ceremonial as well as casual ranging from classroom training session and organisational mentoring of subordinates by their supervisors. Human resource development is directed towards changing the organisation and people associated with it from within, in order to gain advantage over its competitors and ultimately achieving greater amount of success. It also caters to the needs for employee's skill development within the organisation.

For proper understanding of the concept of HRD, it is necessary to understand HRD terminology like learning, development, knowledge and performance etc. Most of these terms contribute to study of the value of human expertise along with ways and means of understanding the concept of skill development. It helps to obtain performance improvement and interrelationship between various concepts which lead to improving the performance at individual, group and organisational levels. The learner develops skill during learning, and puts the newly acquired skills into practice to achieve the expected levels of performance. The main components of any HRD program are training, development and education. Training is the process which caters to the need of fluent and smooth functioning of work and helps in enhancing the quality of skills and life of employees. Development is a process that leads to qualitative and quantitative advancements in the organisation which is not only related with physical skills, but also concerned with knowledge, values, attitudes and behaviour in the working of employees.



**(K.B. Rajoria)**



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