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From President's Desk



We are passing through very difficult times when the environment is plagued by the pollution problem, where construction industry is one of the main polluter. One of the major construction materials responsible for degradation of soil and pollution of environment is manufacturing and use of red bricks in the construction industry. It is an industry that consumes agricultural soil, which is precious gift to the mankind from the Mother Nature, at a rate equivalent to Mumbai city every year. At this rate, we'll soon be facing a major crisis of perpetually loosing agricultural land and sinking into a global shortage of food supply.

After years of overuse, unchecked practices and unplanned industrialisation on fertile land instead on otherwise available non-agricultural land, we have reduced the majority of organic content in the soil. In the greed of fast industrialisation we have conveniently refrained from a national policy of establishing industry only on non agriculture land and conserve agriculture land in line with forest conservation act of 1980. Soil is composed of minerals, organic matter, air, water, and living organisms so created from parent volcanic rocks in millions of years by the mother nature. Without it, we cannot imagine our existence on this planet. We have already lost major portion of top layer of our agricultural soil and if we don't act now it will be too late. However, there are solutions to avert this crisis.

For saving the soil, there is need to spread awareness about soil degradation and gather support from millions of people who want to come forward and fix this crisis. If successful, this could lead to various necessary changes in the way we use and take care of the soil. To reverse the impact and bring back our soil to its nutritional and organic state, it's an immediate need to say 'No' to Red Bricks. One major solution in this direction is replacement of red bricks with AAC Blocks in construction industry.

AAC blocks, a precast, light weight aeriated foam concrete, is a sustainable construction material made from fly ash, a waste product of power plants, aggregates of quartz sand, calcined gypsum, lime, Portland cement, water and aluminium powder. After mixing and moulding, the concrete is autoclaved under heat and steam pressure in autoclaves and it thus quickly gains its distinctive properties.

The AAC blocks have many over-riding benefits over red bricks like these are eco-friendly, sustainable being made from fly ash, leading to clearing of environmentally hazardous waste product stockpiles in a affordable manner, having easy workability, light in weight leading to saving in structural steel, design flexibility, faster construction, minimum wastages, excellent thermal insulation properties leading to huge energy saving, better acoustic performance, fire resistant, cost saving, seismic resistant, accuracy in size, water saver, and termite pest-resistant.

All the stake holders involved in the construction industry should come forward to say 'No' to the use of Red Bricks and instead replace with AAC Blocks or any other eco-friendly sustainable material so as to save the soil, mother nature's gift to the mankind, from degradation.

(Vijay Singh Verma)

IBC News

2nd EC meeting of IBC and open Session-cum-Seminar on 'New Technology in Built Environment' at Kohima

Indian Buildings Congress, Nagaland Centre, in association with Nagaland PWD, hosted the 2nd Executive Committee meeting of IBC and Open Session-cum-Seminar on 'New Technology in Built Environment' at hotel Vivor, Kohima from July 1 to 2, 2022.

The EC in its meeting on 1st July, 2022, besides transaction of its usual business also decided the following:

- (i) Newly formed publication committee to be requested to: (a) take up preparation of document on three topics namely Model Agreement between Buyers and Sellers; Impact of RERA
- (ii) Topic on 'Execution of Projects on EPC Contracts in Construction Sector' for IBC Journal; and
- (iii) Three topics for the seminar during midterm session. Final decision on selection of the topic is left to be taken up in consultation with the host state for the midterm session.



Shri Tongpang Ozukum, Hon'ble Minister Nagaland PWD (Housing & Mechanical) addressing the Open Session-cum-seminar on 'New Technology in Built Environment' held at Hotel Vivor, Kohima on July- 2, 2022

The Open session-cum-seminar was inaugurated on 2nd July, 2022 by Shri Tongpang Ozukam, Hon'ble Minister Nagaland PWD (Housing & Mechanical), who was the chief Guest of the function. Besides the Chief Guest Shri V.S.Verma, President, IBC; Shri Pradeep Mittal, Immediate Past President, IBC; Shri C.Debnath, Vice President; Shri K.C.Meena, Vice President; Ms. Kahuli Sema, E-in-C, NPWD & IBC Nagaland Chapter President; Shri I.Tiameren, CE, NPWD and Shri V.R.Bansal, Honorary Secretary, IBC were on the dais. Shri Toli Basar, CE (Retd.), Arunachal PWD; Shri K.L.Mohan Rao, EC member, Shri Hitendra Mehta, EC Member, Shri Abija Khing, special invitee and Shri Arifa Khanam Special invitee, Large number of IBC members, engineers, architects, contractors and

professionals involved in the building construction industry attended the seminar.

The Seminar was chaired by Shri I Tiameren, Chief Engineer NPWD (H) and General Secretary IBC Nagaland Centre while Shri Kahuli Sema, Engineer-in-Chief, NPWD and Chairman, IBC Nagaland Centre delivered welcome address.

Speaking on the occasion, the Chief Guest maintained that IBC has been contributing immensely towards building a living environment that is sustainable, affordable, aesthetic, eco-friendly, cost competitive and other technology driven built environments in the country. He said by adopting such holistic approach in all our developmental aspects, the IBC can become a

major contributor in our Nation building. He said that the advanced concrete technologies based construction being less time consuming, will minimize the environmental impact, reduce the cost of construction, will be more significant and will have more positive influence in a state like Nagaland.

Shri V.S. Verma, President, IBC in his presidential address, while welcoming the Chief Guest, informed that the country requires 2.50 crores dwelling units by 2030. He therefore underlined the importance of modern technologies in engineering development which are being adopted for quality improvement, energy efficiency, faster construction leading to minimum wastage and minimum environmental pollution and ensuring occupants health and safety.



Shri V.S. Verma, President, IBC delivering his Presidential Address

He informed that use of construction materials having zero or low toxicity, high recyclability, durability, longevity and availability in local regions coupled with fast/rapid construction technologies producing zero/minimum waste is the necessity of the day.

Shri Hitendra Mehta, Mehta & Associates LLP & E.C.Member, IBC, assisted by Shri Parag Bedmutha of M/s K P R Construction, Maharashtra gave a detailed presentation on six light house emerging technologies being used at six places in the country for construction of dwelling units.



Shri Hitendra Mehta making his presentation

- (i) Prefabricated Sandwich Panel System with Pre-Engineered Steel Structural System- In this system the EPS Cement Panels are manufactured at the factory in controlled condition, which are then dispatched to the site. The panels having tongue and groove are joined together for construction of the building
- (ii) Monolithic Concrete Construction using Tunnel Formwork- In 'Tunnel Form' technology, concrete walls and slabs are cast in one go at site giving monolithic structure using high-precision, re-usable, room-sized, Steel forms or moulds called 'Tunnel Form'
- (iii) Precast Concrete Construction System – In this system the individual precast components such as walls, slabs, stairs, column, beam etc, of building are manufactured in plant or casting yard in controlled conditions. The finished components are then transported to site, erected & installed.
- (iv) Precast Concrete Construction System – 3D Volumetric- In this system solid precast concrete structural modules like room, toilet, kitchen, bathroom, stairs etc. & any combination of these are cast monolithically in Plant or Casting yard in a controlled condition. These Modules are transported, erected & installed using cranes and push-pull jacks and are integrated together in the form of complete building unit.
- (v) Light Gauge Steel Structural System & Pre-engineered Steel Structural System- This system uses factory made galvanized light gauge steel components. The components/sections are produced by cold forming method and assembled as panels at site forming structural steel framework upto G+3 building. LGSF is used in combination with pre-engineered steel structural system for buildings above G+3 for longevity, speedier construction, strength and resource efficiency.
- (vi) PVC Stay In Place Formwork System- In this system PVC based polymer components serve as a permanent stay-in-place finished formwork for concrete walls. The formwork System being used acts as pre-finished walls requiring no plaster and can be constructed instantly. Once the structural frame and floor is installed and aligned, wall panels are fixed on decking floor. The pre-

fabricated walling panels having provisions of holes for services conduits, are fixed along with the reinforcement & cavities inside the wall panels are filled with concrete. Upon instalment of wall panels, flooring and ceiling, the finishing work is executed.

A presentation on Nagaland PWD was also made by Swedi Kiso, Executive Engineer, Youth Resources department.

Shri Pradeep Mittal, Immediate Past President, IBC also briefed about the IBC and its activities.

Shri Chinmay Debnath, Vice President, IBC summed up the programme while vote of thanks was proposed by Shri VR Bansal, Honorary Secretary, IBC.

Seminar on "SISO Web Based Project Management Solutions/Information System for Infrastructure and Other Construction Projects"

Indian Buildings Congress organised a seminar on "SISO Web Based Project Management Solutions/Information System for Infrastructure and Other Construction Projects" at 3.00 pm on 28th July, 2022 at IBC Seminar Hall, Sector-VI, R.K.Puram, New Delhi. The Seminar was attended by large number of professionals from different Government departments and other stake holders engaged in the Construction Industry.



Dignitaries on the dais

The Seminar started by welcoming the dignitaries on the dais Shri V.R.Bansal, Honorary Secretary, IBC; Shri Sandeep Sharma, Head-SISO Software's India Pvt. Ltd.; Shri Nuno Vermelhudo, Technical Co-ordinator, SISO Software's India Pvt. Ltd.; and Dr. K.M.Soni, Chairman, Technical Committee, IBC by presenting green sapling, a symbol of growth and energy. All the delegates who had attended the Seminar were also welcomed.



Sh. Sandeep Sharma being welcomed



Sh. Nuno Vermelhudo being welcomed



Dr. K.M. Soni being welcomed



Sh. V.R. Bansal being welcomed

Shri Sandeep Sharma, Head-SISO Software's India Pvt. Ltd. informed the audience that the large projects are characterised by huge data base which needs to be managed for successful project governance and its timely completion. The IT based solution are becoming helpful in effective management of information, enhanced communication, collaboration among various stakeholders, tracking progress and creating data base of the project.

Time is of essence of a project, and organised data & communication are the key to efficient delivery of a project. The industry needs a reliable solution which can assist in the project management needs. A robust PMIS is the very core, the very soul of building and construction needs. Stakeholders require transparency for optimal decision-making.

In his presentation he brought out that the Web-based project management systems are all in one solution that covers the attributes necessary to operate and manage the project from the stage of conception till completion and thereafter or operation and maintenance.



Sh. Sandeep Sharma making his presentation

He discussed the main features of the SISO based web management solutions which are

- Centralized approach;
- Ease in communication;
- Better collaboration;
- Ease in handling multi disciplines in the project on a single platform;
- Helps establish clear goals;
- Identify and anticipate risks,
- Assess the reality;
- Better prioritizing;
- Track real time progress;
- Real-time project status;

- Generation of required reports;
- Data preservation for dispute redressal, operation and maintenance

Shri Nuno Vermilhodo, Technical Co-ordinator, SISO Software's India Pvt. Ltd, gave a demo of the various activities inbuilt in their programme for the Tunnel Project and explained various functions which can be performed with the SISO Web based software, which can be customised to the need of the individual customer.



Sh. Nuno Vermilhodo making his presentation

The presentation by the SISO team was followed by question from the curious delegates which were answered by the SISO team.



Audience raising question

Dr. K.M. Soni, Chairman, Technical Committee of IBC, summed up the Seminar. He informed that the Web based solutions for handling large data of the projects and performing various functions to monitor the project are the need of the day.



Dr. K.M. Soni summing up the Seminar

He appreciated the presentation made by the SISO team. He also emphasised that the management of any data system depends on the correctness of input data. Therefore to ensure successful management of the project, it is the engineer's responsibility to feed the correct data of the project in the programme.

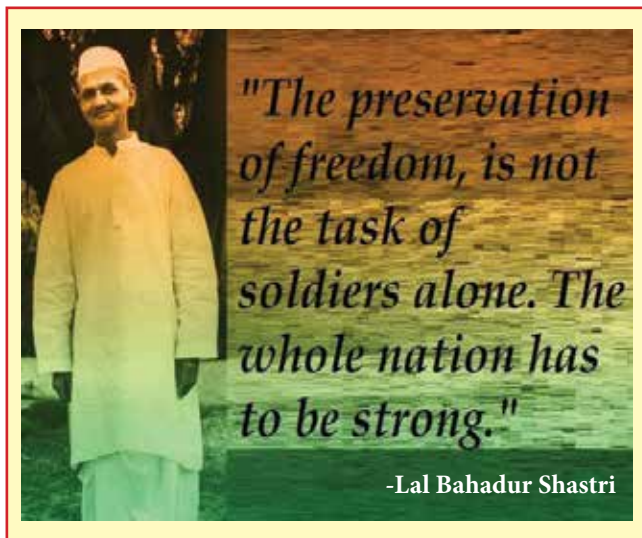


Sh. V.R. Bansal presenting the vote of thanks

At the end of the Seminar, Shri V.R. Bansal, Honorary Secretary, IBC presented the Vote of thanks.



View of Audience



-Lal Bahadur Shastri

Independence Day Celebration of IBC

On The occasion of 'Har Ghar Tiranga Abhiyaan' between 13th to 15th August, 2022 to celebrate the Seventy five years of celebrations of Independence Day, the National Flag was hoisted by Shri O.P. Goel, Founder President, IBC and Shri V.R. Bansal, Hony. Secretary, IBC in the office premises of Indian Buildings Congress in a befitting manner at its headquarters in R.K. Puram, New Delhi on the 13th August, 2022. The flag-hoisting was followed by singing the National Anthem.



View of Hoisting of National Flag at IBC HQ

To commemorate the occasion Shri D. K. Santoshi, Former Senior Architect, DDA and Permanent Invitee of Governing Council, IBC donated two beautiful paintings made by him to the IBC. Shri O.P. Goel, Founder President, IBC, Shri V.R. Bansal, Honorary Secretary, IBC received the paintings on behalf of IBC.



Paintings being Presented by Shri D.K. Santoshi

Activity of State/Local Chapters

Surat IBC Centre

Indian Buildings Congress Surat Chapter Review Meeting

Indian Buildings Congress Surat Chapter held its Meeting on 06th August, 2022 in Room no. 607, Sixth Floor, Advanced Research Center, SVNIT at Surat to review its various activities.

Shri Mukul Patel, welcomed Shri V.R. Bansal, Honorary Secretary, IBC; Dr. Dilip A. Patel, Secretary, IBC Surat Chapter; Shri N.M. Bhatia, Governing Council Member, IBC; Shri Ashok Moitra, Governing Council Member, IBC from Gujarat State; Dr. Rajesh J. Pandya, Vice President, IBC Surat Chapter; Shri Vishal Raiyani, Treasurer, IBC Surat Chapter and all other invitees present in the meeting.

Dr. Dilip A Patel, Secretary, Surat Chapter of IBC, briefed the gathering about the history of formation of IBC's Surat Chapter and apprised the students about the procedure to obtain the IBC Membership. He also mentioned that the IBC Seminars are a great opportunity for members as well as the students to receive practical exposure. He also encouraged the students in the gathering to introduce themselves to the panel members and further encouraged the panel members to take interest in suggesting research domains to the students for dissertation. The gathering in the meeting was also apprised about various workshops that were conducted in the CTM Section by Dr. D. A. Patel to ensure the students to receive vast exposure to the industry from various industry experts. He also informed the dignitaries in the meeting about the first batch, their dissertations and placements. He also mentioned that the current batch students are to select their dissertation domains.



Shri V.R.Bansal, Honorary Secretary, IBC addressing the gathering

Dr. Rajesh Pandya invited all the stake holders in the building construction industry to take active part in technical activities of IBC. He mentioned that though the Surat Chapter was formed only in 2019, the membership of the chapter has risen to 56 inspite of the disruption in the general life due to Covid pandemic. He further mentioned that another IBC Chapter at Gandhinagar (Gujrat) was subsequently formed. He also briefed that various technical activities have been conducted by the Chapter during the period, which are a) Seminar on “Diaphragm Wall Construction: Issues and Challenges” 20 July 2019, jointly with SVNIT and CREDAI Surat; b) One day seminar on “Health and Safety of Construction Workers” 26 September 2019, jointly with SVNIT and Bandhkam Mazdoor Sangathan; c) One week workshop on “Practice to Research and Research to Practice in Construction Technology and Management” during 2-6 August 2021, jointly with SVNIT, IPA, CDE Asia Ltd., CREDAI Surat, and ICEA Surat; d) One week workshop on “Practice to Research and Research to Practice in Construction Technology and Management” during 18-22 April 2022, jointly with SVNIT, SGPPL, IPA, and CREDAI Surat conducted in the online and offline mode, even during the Covid-19 pandemic. He stated that he is looking forward to conduct one session per quarter for ensuring that the members as well as students receive ample exposure from the industry.

Shri Moitra mentioned about the roles played by Civil Engineers in the construction industry. He also enlightened the gathering about the various other professionals that also contribute in the construction industry beside the Civil engineers. He further expressed his interest regarding enlightening the students and faculty members about elevators and lifts in the building practices.

Shri V.R. Bansal, Honorary Secretary, IBC congratulated and thanked Dr. D. A. Patel for having successfully conducted various sessions over the past year for the welfare of the members as well the students. He elaborated the roles and vision of IBC in knowledge sharing besides being a common platform to all the stake holders in the industry. He informed the gathering and especially the students about the memberships that are offered to students and how they can further convert the membership into a lifetime membership. He briefed the gathering on the benefits of obtaining a IBC Membership and also urged them to visit the IBC website to have further information about the IBC and a glimpse of its annual, half yearly and bi-monthly

publications. He suggested that technical activities by the Chapters of IBC can be held in virtual mode to ensure sharing of knowledge.

In the meeting questions raised by the audience were also replied by Shri V.R. Bansal, Honorary Secretary, IBC.

The meeting concluded with presentation of vote of thanks by Shri Vishal Raiyani, treasurer, Surat Chapter of IBC.

IBC was represented at SVNIT Surat in its Diamond Jubilee Conclave

Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat on the occasion of its Diamond Jubilee Conclave held on 6-7 August 2022 with IBC Surat Chapter as one of the partner Organizations, invited Sh. VR Bansal, Hony. Secretary, IBC as one of the Invitee Guests.

The authorities of the SVNIT, welcomed Shri V.R.Bansal, Honorary Secretary to the Conclave. Shri V.R. Bansal, Honorary Secretary, IBC on the occasion delivered his address on the topic **‘New technology and the need to upgrade the academic curriculum in line with the latest trends’**. In his address, he talked about the rapid growth being witnessed in India in Housing and Infrastructure Projects, and the need to evolve and adopt new technologies for its speedy and quality implementation. He also emphasised the need for using new materials and the necessity of eliminating waste so as to economise the cost of construction as well as to preserve the natural resources and thereby, prevent environment disbalance.

Shri Bansal also informed about the developments in new technologies such as Monolithic construction, Jump-form shuttering, Aluminium form-work, Pre-fabricated Building, Pre-engineered Buildings etc. He



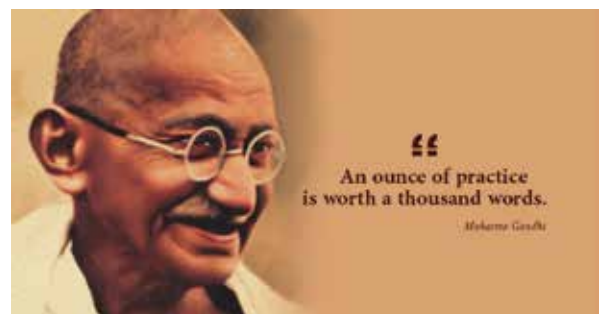
Shri V.R.Bansal, Honorary Secretary, IBC delivering his address at Golden Jubilee Conclave of MNIT, Surat

also mentioned about various new technologies being used in various light-house projects under Global Housing Technologies challenge-India and specially the Tunnel form-work technology being used in such projects at Rajkot, Gujrat.

He also mentioned about various new construction materials such as Self-healing concrete, modular bamboo, use of fly ash in cement and concrete, hardened slag aggregate as a replacement to natural stone aggregate, 3D Printed Bio-plastics as an alternative to concrete construction with 100% recyclability, bio-MASON bricks which do not require firing like clay bricks, solar cells, Robotics and information technology which have the potential of reducing burden on conventional building materials, reducing the environmental pollution in many forms and can contribute in controlling the CO₂ generation and emission of green- house gases. He also expressed the need of integrating the robotics and information technology in construction techniques in future for improvement of quality of construction, faster construction and workmanship.

Sh. Bansal then spoke about the need to recycle the waste being generated by the construction industry as well as the household into wealth. He informed the gathering about the new technologies of recycling of huge C&D Waste so as to re- utilise the recycled product. He also informed about the new technologies available in the field for converting the solid waste being generated by house hold into manure, energy and other useful products which is the demand of the day so as to tackle the problem of garbage disposal and at the same time, harness the green energy out of it for meeting the energy demand.

Shri Bansal, expressed the need of incorporating the new technologies into the curriculum of the academics so that the students are exposed to the technology while they are graduating and contribute in further development. The views expressed by Shri Bansal were appreciated by one and all present in the gathering.



National News

Aluminium-Air Batteries

Lithium battery technology currently dominates the electrical vehicle market and it is expected will dominate over the next decade as it is mature enough to rapidly deliver new electrochemical devices. However, several issues related to safety and large scale availability of lithium have determined in recent years the development of a new research field, known as “beyond lithium” in the attempt to identify innovative systems for electrical energy storage based on different metal anodes. In this context, metal air batteries are the most promising electrochemical devices able to provide high theoretical energy and power densities and also, if properly conceived, to satisfy the sustainability characteristics imposed by modern legislations.

Among the various metals considered as anode in metal-air batteries, Aluminium is the material with the most satisfactory parameters of economy/ ecology and electrochemistry at the same time. The technological challenge in the research on Al-air batteries consists in obtaining sustainable electrochemical devices with practical values of energy and power density, that are competitive with those of current lithium-ion systems. Above all, to make these batteries electrically rechargeable in aqueous electrolytes, taking into account that the re-deposition of the Aluminium during the charging phase is hampered by competitive reactions which consume current before the reduction potential of aluminium is reached.

Indian Oil Corporation Limited (IOCL) has been diversifying into the production of alternative forms of energy in recent years. As part of its strategy, the company has teamed up with Israeli start-up, Phinergy, for the development of Aluminium- air (Al-air) batteries, and the partners are gearing up to soon establish their manufacturing facility.

An Aluminium- Air cell consists of the same building blocks as any other battery—a pair of negative and positive electrodes (anode and cathode, respectively) and an electrolyte. In this case, the anode is formed by Aluminium, while the ‘air breathing’ cathode delivers oxygen from the ambient air. The electrolyte is water-based and is essentially a solution of potassium hydroxide or sodium hydroxide. The Aluminium,

oxygen and water undergo an electrochemical reaction to produce Aluminium hydroxide and electrical energy, which is used to power the motor in an EV.

The energy density is orders of magnitude higher than that of lithium-ion cells, making them lighter, more compact and capable of delivering a much higher driving range than what is possible with today’s electric vehicles. Aluminium is abundantly available in our country—we are an aluminium-rich country. This, then, can help minimize our dependence on imports for battery production.

Moreover, aluminium is far cheaper than lithium and easily recyclable as well. As such, Aluminium-Air batteries could undercut the prices of their Lithium-ion counterparts by a significant margin, essentially addressing one of the main impediments to EV adoption.

However, Aluminium-Air cells cannot be conventionally recharged. Aluminium is consumed in the reaction to produce electricity, giving a few thousand kilometres of driving range before the anodes have to be replaced. This could prove to be a cumbersome task and require the setting up of a battery-swapping network.

To achieve the desired results for the benefit in transportation industry and ultimately to the mankind through environment protection, the Indian and Israeli firms have created a JV called IOC Phinergy. The partners will soon setup an Al-air battery production facility in India. Maruti Suzuki, M&M and Ashok Leyland have signed letters of intent with IOC-Phinergy to test this new product.

Indian Railways moves ahead on ‘Maglev Trains’ project

Indian Railways aims to implement the first stretch of the Maglev project in less than three years’ time.

Moving ahead with the introduction of the high-speed Maglev (magnetic levitation) trains in the country, the Indian Railways has asked Rail India Technical and Economic Service (RITES) to prepare a detailed project report. The railways aim to implement the first stretch of the project in less than three years’ time.

“We would be very closely associated with RITES as they would collect all the required data after which we would together do the analysis of the sufficiently high clientele sectors where Maglev can be implemented,”

said Nitin Chowdhary, executive director, mechanical engineering (development), Ministry of Railways.

Maglev trains which run at a minimum speed of 350 km per hour (kmph) and maximum 500kmph without touching the ground are based on the magnetic levitation technology wherein the train is elevated 1 to 6 inches above the ground through a system of magnets thereby making the train move frictionless at high speeds. The project would be implemented on a PPP (public-private partnership) basis as a joint venture between the railways and a private company wherein the railways would contribute 26% of the equity.

“Two private companies can also form a JV within themselves but the resultant JV would have to in turn work with us in a joint venture by sharing the technology for the project and not be our competition instead,” explained Chowdhary.

According to Chowdhary, the objective is to have a core incubator group with a mandate to develop Maglevs in India. The group will brainstorm with the industry as well as the railways. The close knit group will also oversee the development of the Evacuated Tube Transport (ETT) for freight which would run along the Maglev trains. Refuting the notion that Maglev would be too expensive a project to generate positive returns, Chowdhary said, “Developing Maglevs won’t be as expensive as people are thinking it to be since we have spoken to a lot of vendors about it and it seems doable.”

He added that for people the priority has shifted towards saving time and if Maglev can provide that with high-end quality service, then passengers will be willing to spend a higher fare amount. In September this year, six companies, including Bharat Heavy Electricals Ltd and Switzerland-based SwissRapid AG, had evinced interest in developing Maglevs in India.

72 Nations to adopt Indore’s waste-to-energy model - Resolution Passed by the United Nations

In Swachhta, Indore leads rest of the world follows. Following the footsteps of Swachh city. 72 Asian and African countries are now replicating the bi-methenation model for treatment of wet waste into bio-CNG.



Bio CNG Plant at Indore

A resolution in this regard was passed in a conference of International Forum for Sustainable Asia and Pacific held recently in Tokyo. The conference was hosted jointly by United Nations (Asia Pacific Region) and government of Japan on Sustainable Technologies.

Indore Municipal Corporation (IMC)’s waste management consultant Asad Warsi was invited as a technical expert to give a presentation about technical features of bio-methenation plant that was set up in Indore for producing bio-CNG out of wet waste generated in city daily.

“A resolution has been passed by UN and it has been decided that the model of Indore’s biomethenation plant will be replicated in about 72 countries of Asia Pacific Region,” Warsi told TOI.

Countries like Bhutan, Nepal, Bangladesh, Japan, Malaysia, Iraq, Maldives, Oman, South Korea are on the list. Warsi said that at least one biomethenation plant with 50 tonne capacity each would be set up in each of these countries by UN with help of the Japanese government. After that, it will be upto respective nations to carry on with the initiative or develop it further.

Speaking about major features that prompted the international forum to pass the resolution, Warsi said that Indore’s biomethenation model was found to be one of the most sustainable, cost effective zero waste model for wet waste management. Besides, its operation and monitoring are also foolproof.

Thermocol from farm stubble, polybags that dissolve among ideas to curb use of plastic

With over 19 single-use plastic items facing a ban from July 2022, a few start-ups have offered solutions and alternatives to ensure that this prohibition doesn't fall flat like earlier ones.

The start-up of Arpit Dhupar, who studied biotech at IIT-Delhi, has devised biodegradable thermocol - like material made of stubble. His NCR-based firm, Dharaksha Ecosystems, hopes to solve both the stubble crisis and polystyrene reaching landfills and drains.

"Thermocol is worse than plastic as it isn't recyclable. Almost 95% of it reaches landfills and catches fire easily. We had developed a biodegradable thermocol using paddy stubble, which can be moulded in any shape and can decompose within 14 days. After processing, stubble is bio-fabricated using strains of mushroom roots," said Dhupar. Stating that it was a win-win situation for all concerned, Dhupar added, "At least 5 million tonnes of thermocol are produced annually in India alone. The volume used to pack one set of glassware can pollute 5,000 litres of air. Besides, stubble on over two million hectares under paddy in Punjab and Haryana is also burned. Last year, for research and development, we procured stubble from 180 acres. This year we are aiming at 1,500 acres of stubble".

Neha Jain, whose start-up Zero Circle recently got facilitated by Central Pollution Control Board, has developed a polybag-like material that can dissolve within weeks and is safe to be eaten by both land and marine animals.

"The packaging solution is ocean safe. It has applications similar to polybags, but the only difference is that it dissolves. The material is made of seaweed extracts, thus making it safe for consumption by animals. We had tested it with emulsions and oil, so it can be used as packaging materials. It is transparent, stretchable and does not make a crackling sound. The best part is that one can simply dump it anywhere and it will degrade within six weeks. But the product cannot store water," said Jain.

Vaibhav Anand, who runs the start-up Bambrew, said. "We have succeeded in enhancing the property of paper to behave like plastic. This material can be used as milk packets. However, due to cost constraints few milk producers have reached out to us. But the millions of used milk bags that often reach landfills turn out

to be far more expensive. His Bengaluru-based firm is already providing packaging solutions to several retailers, e-commerce, food delivery apps in Delhi."

"Packaging alone comprises 55% of the total waste generated and recycling plastic is not a solution as it can only be recycled once or twice. Later, virgin plastic is needed to recycle it, which requires producing more plastic," added Anand.

India creates another world record for building Longest Double-Decker Flyover

The National Highways Authority of India (NHAI) and Maharashtra Metro achieved the world record for constructing the longest double-decker viaduct with a length of 3.14 km in Nagpur. The longest viaduct with highway flyover and metro rail supported on single column piers. The maximum metro stations constructed on a double-decker viaduct are recognized by the Asia Book of Records & India Book of Records. The development is the fulfilment of the promise by Prime Minister on building world-class infrastructure in New India.

They have also recognised another record of constructing three metro stations on a double-decker viaduct. "Another World Record in the bag! Heartiest Congratulations to Team Maha Metro and Team NHAI on achieving the world record in Nagpur," said Union Minister of Road Transport and Highways. This 3.1 Km long double-decker viaduct was built jointly on Nagpur's Wadha road by Maha Metro and NHAI. This double-decker viaduct made possible a three-layered transport corridor with the first layer occupied by pre-existing highway, the second layer by a flyover highway, and the third layer by Nagpur metro rail.

The flyover highway is built at the height of nine metres, and the metro at 20 metres. While 2.7 km of this multi-layered corridor has a four-lane road on its second level, half km has a six-lane road. NHAI has used RIB and spine techniques to build this viaduct. This project has led to saving on land acquisition and construction costs and also reduced the travel time to the city's airport.



Longest Double-Decker Flyover

First time use of Robots by Firemen to douse blaze in Delhi

In a first, the fire department on 26th June, 2022 used two robots to douse a blaze that had broken out in a three-storey plastic godown in Samaypur Badli near Rohini Jail, New Delhi. No injuries or casualties were reported. It was a massive blaze and took more than 10 hours to control it. Plastic granules were lying inside. Due to a blast, the third floor had fallen. Though as reported no one was injured but, investigation is on to ascertain the reason behind the fire.

Shri Atul Garg, Director, DFS, said they used two robots to douse the fire. “We did not know that combustible materials were kept inside the factory. There were chances of a blast or building collapse due to the heat, so we used both our robots in dousing the blaze,” he added. In May, Delhi government inducted two robots that had landed in India from Austria, in the city’s fire fighting fleet.

Each robot can spray 2,400 litres of water per minute on the fire source. The atomised water jet generates billions of tiny droplets and throws it at a distance of over 60 metres. If the usage of foam is necessary, the fire fighting support vehicle can be switched to it. The throw distance of foam is around 35 metres. The crawler chassis allows accurate driving. Its turning manoeuvre is designed to remove any kind of movable obstacles.

India to soon have an E-Highway

In a bid to reduce pollution, the Government is planning to construct an electric highway between the National Capital Delhi and the Financial Capital Mumbai. Trolleybus and heavy vehicle owners will be able to run trolley trucks on the e-highway, Union Minister of Road Transport and Highways said at an event organised by the Hydraulic Trailer Owners Association (HTOA) on July, 11, 2022.

The Minister has been pushing for the adoption of electric vehicles and encouraging electrification in India. Back in 2016, Shri Gadkari had told PTI in an interview that the country could have an electric highway stretch similar to one in Sweden.

Three years ago, Germany launched its first electric highway on a six-mile-long stretch of Autobahn near Frankfurt. It allows hybrid cargo trucks to recharge their batteries while travelling. At present the world’s longest



Electric Highway

e-highway is in Berlin which is stretched over 109 Km. If the Government’s plan materialises, then India will have the world’s largest electric highway. The proposed project between Delhi and Mumbai will enable motor vehicles to get charged while on the move. Generally, an overhead network of electricity lines is laid, which helps in powering the on-road vehicles.

First-of-its-kind-Wind Turbine

A Hyderabad based company has come out with India’s first Rooftop Wind Turbine to generate Green and sustainable energy. The project was initiated a couple of years earlier and the ‘Rooftop Wind Turbine’ is the first of its kind in India to generate green and sustainable energy; said a press release from the company. Speaking of the turbine, Suryaprakash Gajjala, CEO of Archimedes Green Energys, claimed that it is a ‘Make in India’ product.

Gajjala is also a recipient of the MSME National Award from the Ministry of Micro, Small and Medium Enterprises (MSME). Speaking about the turbine, he said, “The Korean Government has given us the grant to demonstrate and study its performance of the



Rooftop Wind Turbine

Archimedes Wind Turbine in and around southern states of India. This project is undertaken in association with Gitam University, Hyderabad.”

He added that the Rooftop turbine is silent and can generate half of a household’s energy requirement. “That too it is renewable, clean, and green energy. Wind power is one of the cleanest sources of renewable energy in the world,” he stated. The product has been manufactured in India with the help of Korean ESCORTS and Dutch technology. It can produce 1kWh of energy at an average wind speed approximately half an average household’s energy use.

The sleek, aesthetically good looking windmill yields more energy, produces little noise, is bird friendly apart from looking good. This maintenance free turbine can be fixed on top of an apartment, in fields and everywhere. It can rotate 360 degrees into the direction of the wind like a weather vane. The best part is that it also works in low velocity winds from 0.9 meter/Second to as high as 14 meters/second. In high winds such as 22 meters/second, brakes get activated and the turbine stops to avoid damaging itself.

The two variants - small of 36 Kgs and big 112 kgs is easily transportable and is available in six impressive colours. The Wind Mill has Fibre Reinforced Plastic Blades which are long lasting. The company has an MoU with BITS Pilani Goa, for Technical Testing and Certification. The Archimedes Wind Mills (AWM) comes in two sizes: The 1.5 meter diameter with a rated power of 700 Wh and a maximum of 1 Kwh and the 0.75 meter diameter with a rated power of 125 Wh and a maximum of 150 Wh. The AWM shows to be highly efficient (about 35% of all kinetic energy in the air), is very silent (below 45 dBA), is bird and bat friendly and has a beautiful design suitable for urban and rural areas.

Pinnapuram – World’s biggest Integrated Renewable Energy Storage (IRESP)

The Pinnapuram Integrated Renewable Energy with Storage project (IRESP) is a 3.6GW hybrid renewable



View of Pinnapuram Solar Panel Project

energy project comprising a 2GW photovoltaic (PV) solar farm, a 400MW wind farm, and a 1.2GW pumped storage hydroelectric facility proposed to be developed in the Pinnapuram village, in the Kurnool district of Andhra Pradesh, India.

The hybrid solar-wind-pumped storage project is being developed by Greenko, a renewable independent power producer (IPP) based in India.

The Pinnapuram IRESP is expected to be India’s first and one of the world’s biggest such facilities to supply schedule power on demand (SPOD). Designed for both peak load and baseload operations, the integrated facility will be capable of generating up to seven billion units of electricity a year.

The Pinnapuram pumped storage hydroelectric facility will comprise a lower reservoir, an upper reservoir, and a subsurface powerhouse measuring approximately 240m-long, 24m-wide, and 58m-high. The powerhouse will be connected with six tunnels and penstock pipes and will be equipped with eight Francis type, vertical shaft, variable speed, and reversible pump-turbine units. The turbines will operate at a rated head of 134m. Each of the penstocks will be 760m-long with a 7m-diameter. One of the six penstocks will be bifurcated into two penstocks. The facility will also house a 420kV gas-insulated switchgear (GIS) along with step-up transformers near the powerhouse.

The lower reservoir for the Pinnapuram pumped storage hydroelectric facility will be the existing Gorakallu (Narasimharaya Sagar) reservoir which is located near Gorakallu village in the Nandyal Mandal, approximately 80Km away from Kurnool. The upper reservoir for the project will be created by constructing a 49m-high dam near Pinnapuram. The upper reservoir will be created across Muni Madugu and will have a catchment area of approximately 9.45km². The live storage capacities of the lower and upper reservoir will be 12.44 thousand million cubic feet (TMC) and 1TMC respectively.

The pumped storage facility will utilise approximately 1,140MW of electricity to pump 1TMC of water from the lower reservoir to the upper reservoir for storage in 9.2 hours. While operating in turbine mode, the facility will generate up to 1GWh of electricity by utilising 862.5 cubic metres per second (Cumec) of the design discharge of stored water from the upper reservoir.

The Pinnapuram integrated renewable energy facility will have a central pooling station to gather electricity from each of the three components of the project. The electricity from the Pinnapuram IRESP common pooling station will be evacuated into the national grid through connection to the Power Grid Corporation of India's (PGCIL) 765/400/220kV substation near Orvakallu.

IIT Team Develops Map on Rain-Induced Erosion

Researchers at Indian Institute of Technology (IIT) Delhi have developed a map to highlight areas that are prone to rain-induced erosion. The map is intended to help in planning, prioritising and implementing essential watershed development activities to minimise soil erosion.

Professor Manabendra Saharia, from the department of civil engineering, said, "This study is a step towards building a national-scale soil erosion model in India. The map will facilitate watershed managers to identify rain erosivity potential at diverse locations and accordingly plan, prioritise and implement essential watershed development activities to minimise soil erosion."

According to officials, parts of Assam and Meghalaya are among Indian zones prone to the most significant rain-induced soil erosion. IIT Delhi professors explained that the most vulnerable region to rain-induced erosivity has been found in the Laitkynsew and Cherrapunji region of East Khasi Hills in Meghalaya while the least vulnerable region was in Ladakh.

Navjiwan Vihar becomes first to attain 100% Waste Segregation

The Navjiwan Vihar colony in Malviya Nagar, New Delhi with 250 households in Malviya Nagar Ward (63-S) is probably the first in New Delhi to have attained such an exemplary work of 100% waste segregation at source in solid waste management. Almost all the households in Navjiwan Vihar are handing over only segregated waste to the waste collectors.

Shri Vinay Bhasin, President, RWA Navjiwan Vihar, shared how the visionary project originated looking at the evolution of Solid Waste Management Rules in India that necessitates the role of Resident Welfare Associations (RWAs) in tackling Municipal Solid Waste at the household level.

Dr. Ruby Makhija, Secretary, Navjiwan Vihar RWA, expressed that a die-hard effort of RWA Executive Committee along with the support of environmentally conscious residents and colony children who went door to door convincing the residents to segregate garbage of this upscale colony resulted in this unique achievement. SSIL and SDMC had pivotal roles to play in the success of this program. SSIL staff trained the garbage collectors and also hold regular training workshops for the residents and their domestic helps. WOW (Well Being out of Waste), a CSR initiative of ITC Company also provided support to the program. The wet waste from the colony goes straight to the compost pits and is converted to rich compost that is further used for the colony parks. Each park in the colony has a leaf composter that takes care of most of the green waste converting it into 'black gold'. To create awareness whatsapp broadcast and circulars was sent out by Navjiwan RWA to all residents on a regular basis.

Maha Metro's Zero Mile Freedom Park station at Nagpur

Zero Mile Freedom Park is a metro station on the Orange (North-South) line of the Nagpur Metro in the city of Nagpur, Maharashtra. It is named after the nearby Zero Mile Stone which was built in 1907 to mark the Great Trigonometrical Survey of India. The station was opened on 21 August 2021.

The Nagpur Metro Rail Corporation (now Mahametro) launched a global competition on 5 June 2015 inviting bids for the Zero Mile and Sitaburdi metro stations. Twenty-three architecture firms submitted designs in response. The metro authority shortlisted 13 firms for the detailed design stage, and eventually requested four firms to submit designs. A panel of architects appointed by the authority to pick the winning design, and the preliminary design of the winning entry was unveiled by the metro authority in May 2016.

The Zero Mile station is a 20-storey building with two basements. The building's facade is made of locally-sourced glass and stone. It is located on a 12,000 square metre plot of land on Wardha Road. Mahametro completed the demolition of a two-storey building of the fisheries department that was previously located on the site in January 2018.

The station is equipped with 8 escalators, 10 lifts, and also features multi-level parking with a capacity to accommodate 244 cars. Apart from the metro station and related facilities, the station building also contains hotels, restaurants, commercial places, offices, and a banquet hall.

The Zero Mile Freedom Park Metro Station, a masterpiece of architecture in Nagpur, is the first of its kind in the country to be part of a magnificent 20-storey building with a metro train on the fourth floor. Out of the 20 floors, 13 will be used for commercial purpose which will enhance the Nagpur Metro's revenue. Nagpur Metro uses 65 per cent of Solar energy for its operation, the metro project is capable of being a clean and sustainable model.

23-YO Designs Solar-Powered Umbrellas

Mr. Adeeb Mansuri, an engineering student from Ahmedabad in a laudable move, designed two umbrellas that not only provide shade but also cool air. The one-of-its-kind umbrellas are in-built with a small fan, charging sockets and solar panels with a capacity to generate up to 20 watts. They also have a battery backup that can be used at night.

Adeeb has provided the two umbrellas (each costing up to Rs 3,000) for free to the traffic police, which are



Solar powered Umbrella

being used at two traffic crossings in the Ahmedabad city. It has received positive responses from the force. "They (police) really liked the umbrellas as the fan and charging point are very efficient.

The idea of making such a sustainable innovation struck Adeeb after he came across solar-powered table fans. He instantly enrolled himself in the incubator centre of his college and started working on a prototype umbrella for the college's security guard. With financial help from college and guidance by the professors, Adeeb successfully built and tested an umbrella given to the security guard. Now with encouragement and positive feedbacks from the city police, Adeeb hopes to make it commercially viable and eventually launch his product.

Obituary



Shri Suresh Jain, Former President, Builders Federation of India (BFI) and Past President, IBC expired on July 23, 2022. Shri Jain was Life Member of Indian Buildings Congress for last many years. Indian Buildings Congress deeply mourns the sad demise of Shri Jain and prays for the departed soul to rest in peace in the heavenly abode.



Shri Kuldeep Khilariwal, Chief Consultant, Arch.-in-Tech., and G.C. Member, IBC expired on Aug. 24, 2022. He was Life Member of Indian Buildings Congress for last many years. Indian Buildings Congress deeply mourns the sad demise of Shri Khilariwal and prays for the departed soul to rest in peace in the heavenly abode.

India's First Six-Lane Road Constructed from Steel Slag Inaugurated in Gujarat's Surat

Union Minister of Steel on 15th June, 2022 inaugurated India's first six lane 1 km road made by using steel slag at Gujarat's Surat to connect the port with the city.



Union Steel Minister Shri Ram Chandra Prasad Singh inaugurated the road

The road constructed by 100 per cent use of steel processed slag is a real example of converting waste into wealth and improving sustainability of steel plants, the minister said. The minister further said that the use of such material in road construction will not only increase durability but also help in reducing the cost of construction as slag-based materials have better properties than natural aggregates. Slag is a by product of steel manufacturing.

The experience gained from this road will be utilised for developing detailed guidelines for widespread usages of steel slag in construction, the Steel Ministry said in a statement. The ministry is exploring all other options to utilise such materials in road construction, agriculture as a replacement to soil nutrients and fertilizers, ballast for railways and making green cement. Steel Ministry has already awarded several R&D projects for utilisation of different types of slags generated during manufacturing of steel and majority of which are being considered as a liability, the statement said. The road constructed by using steel slag is also part of the R&D project sponsored by the Ministry along with other major steel players.

Troubled by power cut, a young man built his own Power Plant

A young man from Jharkhand, troubled by the power cut, installed a mini hydro power plant on the river

flowing near the village. Due to the exploits of this young man, now the people of the village are getting free electricity upto 5KW to light the bulb. Shri Kedar Prasad Mahato, a resident of Bayang village of Dulmi block of Jharkhand, saw the problem of electricity in the village, and thought of generating electricity. After nearly 18 years of tireless efforts, Shri Kedar has set an example by producing five kilowatts of electricity from water by applying indigenous jugaad. Today, with this electricity, the village along with its surrounding including Durga temples of the village are being illuminated.



Kedar invent Power Plant

In the year 2004, Shri Kedar started trying to generate electricity. At that time Shri Kedar got success in producing 12 volt electricity. After this his interest in electricity generation increased. In the year 2014, it was successful in producing one KV power. After this, he was engaged in his project for four consecutive years and in the year 2021, he made five kilowatts of electricity. About three lakh rupees have been spent on this hydro power plant. Shri Kedar has studied up to BA Part-I from Ramgarh College. He does wiring work, with the money he saves, he is trying to turn his dream into reality.

In the year 2014, Shri Kedar did the first experiment by lighting a bulb from the wheel of a cycle. He has also gone to Ranchi to take technical knowledge. He said that he knows how to do wiring and electrical work. He has been doing wiring work since his 12th standard. As soon as the success was achieved, the project of generating electricity boosted his spirits. He took it as a project since then and conducted the first experiment on the Senegada river, a kilometer away from his village. A concrete pillar was built in the middle of the river and installed a turbine with armature, magnet, coil and

other parts. It took many years to build all this slowly and prepare the setup.

It cost three lakhs to make it, out of which some financial help was given by his friends and the rest was his own deposit. He was interested in working as an electrician and spent all the money earned from it in fulfilling his passion.

Time to re-imagine Architecture for our Overheated Cities

With recent temperatures in North India soaring to 48°C, enjoyment of any kind is far from people's mind. Instead, new records of the worst kind are being set every summer season — daily heat-wave deaths, reduced river water and depleting ground water levels, and a myriad of other heat-related issues in cities such as dehydration and heat stroke, unimaginably high air conditioning and energy requirements, consequent load shedding and blackouts.

The cities in summer become a heat sink — where the prevailing atmospheric temperature becomes grossly magnified by modern construction materials and buildings. The old bungalow and other models of traditional Indian construction — such as northern havelis, or southern Chettinad houses — dispersed the heat through clay tile walls, mud-insulated roofs, and a string of ventilating and shading devices like courtyards and verandahs. By contrast, modern architecture's expensive and inappropriate materials impact the house adversely, additionally burdening it with heavy electrical loads for air-conditioning. Today, 40% of all energy costs in the country come from buildings — the production of materials, their transport and construction, and eventual maintenance, cooling, heating etc. Does that sound like an efficient outlay of cost, or indeed a reasonable solution in the era of climate change?



Expensive and inappropriate building materials only add to energy cost

Short of a miracle, the salvage of India's overheated cities hinges on three critical factors: first and foremost is the establishment of an altogether new type of home that includes efficient planning, new materials and construction methods. With 1.2 crore urban homes yet to be built under the Pradhan Mantri Awas Yojana, architects must confront the need to use natural materials in more efficient designs, using passive ventilating systems. The growing frequency of intense heat waves must require mandatory incorporation of cooling techniques, and a diverse architecture laid out around courtyards, vegetation, water and landscape.

Second, is the larger aspect of the home's placement in an ecologically sustainable neighbourhood, where water, electricity, parks, playgrounds and other amenities are an integral part of a shared plan. Along endless stretches of East Delhi, along new metro linked roads of Jaipur, and miles of new neighbourhoods in Pune, the absence of trees, water, shade, or sidewalks make the city a wasteland with no possibility of outdoor life. It is crucial then to frame more liberal eco-centric by-laws that focus on civic and community patterns rather than merely setting limits on private construction. Some environmental planners have even suggested an experimental biological model of urban layouts — a radical idea that calls for the administrative division of cities into smarter ecological packages that include building, open space, green cover, water catchment and waste management. Sharing utilities and services in feeder grids, such self-sustaining urban islands would get defined by their bio-mass — a green cover proportionate to the numbers housed there.

Third and most crucial is the inclusion of two key ingredients — risk and imagination. To build houses according to standard unchanging formulas has so far only yielded lifeless and unresponsive buildings. Architecture can be a far more innovative act when it encourages new forms of living, backed by advanced technologies and mixes. Some things of course are slowly changing. Architects are growing grass on the sides of their buildings, wheat farms on the roof. Some are looking at underground houses, others experimenting with thermal cooling through wind tunnels and hollow walls. However far-fetched it may sound now, the potential for such applications in a desperately hot and unliveable future cannot be dismissed. When cities are already overbuilt with the wrong type of buildings, new architecture must be used as an informed corrective to make bold ecological statements that not only eradicate the impact of the heat wave but make urban life better.

The Architecture of old bungalows in metro's have also transformed with the time. The bungalows are still there but the life it now supports is altogether different. The verandah is enclosed in an all-glass lobby, its creepers replaced by an ornamental palm. The garden has been paved over for parking, windows sealed and supporting packaged air conditioning units. A massive generator hums along the side wall. The house is a machine to be charged daily. In barely half a century, its ecologically sustainable architecture has travelled from living with the earth to dying without it.

चीन सीमा तक अलग से बिछेगा रेल ट्रैक

सामरिक महत्त्व की भानुपल्ली-बिलासपुर-मनाली-लेह ब्रॉडगेज रेललाइन से अलग सेना के लिए लेह में चीन सीमा तक करीब 13 किलोमीटर ट्रैक बिछाया जाएगा। यह ट्रैक लेह शेशरथांग के करीब नदी के किनारों से होकर बिछाया जाएगा। इस ट्रैक के बनने से सेना को सड़क मार्ग से सामान नहीं ले जाना पड़ेगा तथा रसद पहुंचाने में आसानी होगी।

मुख्य ट्रैक पर भी शेशरथांग समेत पांच स्टेशन ऐसे होंगे, जहां सेना को सामान उतारने-चढ़ाने की विशेष सुविधा दी जाएगी। इन स्टेशनों पर लूप लाइन बनाई जाएगी ताकि यात्री स्टेशन के कारण कोई समस्या न आए।

सेना के लिए बनने वाली इस विशेष पटरी को पूरा करने के लिए एक पुल और टनल का निर्माण भी किया जाएगा। सामरिक, व्यापारिक और पर्यटन की दृष्टि से रक्षा मंत्रालय की सबसे महत्वपूर्ण परियोजना भानुपल्ली-मनाली-लेह रेल लाइन की कुल लंबाई करीब 476 किलोमीटर है। इस सामरिक रेल लाइन के लिए करीब 150 किलोमीटर विभिन्न अप्रोच मार्ग बनेंगे।

भानुपल्ली-मनाली-लेह रेल लाइन की डीपीआर के अनुसार पुलों, टनलों, सिविल कार्य, इलेक्ट्रिकल, सिग्नलिंग और टेली कम्यूनिकेशन, भूमि अधिग्रहण और अन्य कार्यों पर करीब 99,000 करोड़ रुपये खर्च होंगे। हिमाचल और लद्दाख में क्रमसः 1100-1100 हेक्टेयर भूमि का अधिग्रहण किया जाएगा। इसमें 26% वन भूमि भी शामिल है। भूमि अधिग्रहण पर 11.5 हजार करोड़ रुपये का खर्च आएगा। इस रेल लाइन में चार खंड होंगे। पहला खंड बैरी से मंडी, दूसरा मंडी से मनाली, तीसरा मनाली से उपशी और चौथा उपशी से लेह तक का होगा। रेल लाइन के लिए 62 हजार करोड़ की लागत से पुलों और टनलों का निर्माण होगा।

प्री-कास्ट निर्माण तकनीक, रैपिड रेल कारिडोर के लिए त्वरित निर्माण का पर्याय बनी

रीजनल रैपिड ट्रांजिट सिस्टम (आर.आर.टी.एस.) के दिल्ली-मेरठ कारिडोर के निर्माण में बड़े स्तर पर प्री-कास्ट तकनीक का उपयोग किया जा रहा है। इस तकनीक की मदद से कहीं भी ट्रैफिक प्रभावित नहीं हो रहा है। कारिडोर के सभी एलिवेटेड स्टेशन, जिनमें सराय काले खां, न्यू अशोक नगर, साहिबाबाद, गाजियाबाद, गुलधर, दुहाई, मुरादनगर, मोदीनगर उत्तर, मोदीनगर दक्षिण और मेरठ शामिल हैं, में कानकोर्स और प्लेटफार्म लेवल का निर्माण प्री-कास्ट तकनीक से हो रहा है।

लांचिंग गैट्री (तारिणी) का उपयोग करके पहले से ही एलिवेटेड वायाडक्ट बनाया जा रहा है, जो आर.आर.टी.एस. वायाडक्ट के निर्माण के लिए गार्डर के विभिन्न भारी खंडों को उठाकर उन्हें आपस में जोड़ता है। इस प्रोजेक्ट में 80 प्रतिशत से भी अधिक सिविल संरचनाओं को प्री-कास्ट किया जा रहा है। इन प्री-कास्ट संरचनाओं का उपयोग करने से पहले गहन गुणवत्ता जांच भी सुनिश्चित की जाती है।

इन संरचनाओं को 82 किलोमीटर के कारिडोर में प्रयोग करने के लिए वर्तमान में 10 अत्याधुनिक कार्स्टिंग यार्ड, दिल्ली, गाजियाबाद और मेरठ के विभिन्न स्थानों पर उच्च तकनीक सुविधाओं के साथ बड़े पैमाने पर 24 घंटे काम किया जा रहा है।

प्री-कास्ट निर्माण तकनीक के द्वारा, निर्माण कार्य, न केवल, द्रुत गति से चल रहा है अपितु निर्माण कार्य में निर्माण सामग्री की बर्बादी भी नहीं हो रही है तथा पर्यावरण संरक्षण को बढ़ावा भी मिल रहा है।

इंदौर ने कान्ह एवं सरस्वती नदियों को पुनर्जीवित किया

दुनिया में जब भी नदी को पुनर्जीवित करने की बात होती है तो लंदन की थेम्स नदी को फिर से जीवंत बना देने का उदाहरण दिया जाता है। मगर अब लंदन की ये कहानी बहुत पुरानी हो चुकी। नई कहानी इंदौर ने लिखी है, जिसने अपनी कान्ह और सरस्वती नामक दो नदियों को पुनर्जीवित कर दिया है। अब ये नदियां इतनी जीवंत हैं कि इनके कुछ हिस्सों में मछलियां तैरती हैं।



नदी में मिलने वाले नालों के गंदे पानी के उपचार के लिए कबीटखेड़ी में बनाया गया ट्रीटमेंट प्लांट

एक समय ऐसा था जब कान्ह नदी इंदौर के सबसे बड़े नाले के रूप में पहचानी जाती थी। किंतु अब करीब 21 कि.मी. लंबी कान्ह नदी का अधिकांश हिस्सा साफ किया जा चुका है। इसी तरह 15 कि.मी. लंबी सरस्वती नदी को भी इंदौर साफ कर चुका है। इन नदियों में मिलने वाले करीब 5500 बड़े तथा 1800 घरेलू व छोटे नालों को बंद करने का काम भी किया गया। इन दोनों नदियों में बहने वाला गंदा पानी पाइप लाइन के माध्यम से शहर के सात सीवरेज ट्रीटमेंट प्लांटों में भेजा जाता है, जहां प्रतिदिन 312 एमएलडी से अधिक गंदे पानी को उपचारित करके उसे इन नदियों में बहाया जाता है। इस तरह इंदौर नगर निगम ने शहर के करीब 135 किलोमीटर लंबे नदी नालों में गंदे पानी की आवक रोकने की दिशा में सफलता अर्जित की है।



विशेष मशीनों के जरिये नदी से निकाला गया कचरा

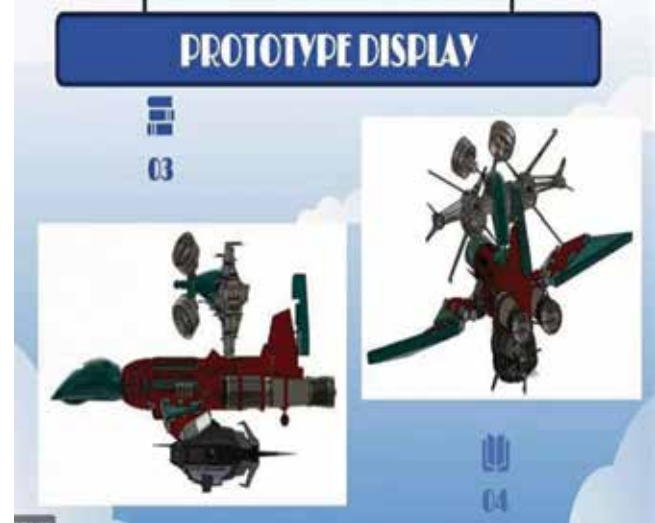
केंद्र सरकार ने देश के लगभग सभी प्रमुख शहरों को अमृत योजना के तहत गंदे पानी की समस्या से निपटने के लिए बजट देने का प्रावधान किया था। इंदौर ने इस योजना का पूरा लाभ उठाया। इस योजना के तहत 220 करोड़ रुपये खर्च कर इंदौर में सीवरेज नेटवर्क का विस्तार किया गया, शहर में सात सीवरेज ट्रीटमेंट प्लांट बनाने का काम हुआ। इन सीवरेज प्लांट से इंदौर ने 397.50 एम.एल.डी. गंदे पानी को प्रतिदिन उपचारित कर साफ कर लेने की क्षमता हासिल कर ली। इस प्रयास का लाभ यह हुआ कि सरस्वती नदी में अब दुर्गंधरहित उपचारित पानी बहने लगा है। इन्हीं प्रयासों के बाद शहर वाटर प्लस भी बना और केन्द्र सरकार से सम्मान भी हासिल किया।

इंदौर की सरस्वती नदी 1970 तक निर्मल थी। यद्यपि इसमें तब बारिश का पानी ही बहता था, किंतु भूमिगत जलस्तर बेहतर होने के कारण वर्ष में आठ से 10 महीने इसमें पानी रहता था। फिर इंदौर की आबादी बढ़ी, भूजल स्तर भी घटा, गंदे नाले बढ़ते गए, जिनका पानी सरस्वती नदी में जाने लगा। इस तरह एक दशक में यह नदी गंदा नाला बन गई। किंतु अब फिर यह अपने मूल स्वरूप में लौट रही है। अब तो इसमें बहते पानी की गुणवत्ता को बनाए रखने के लिए नगर निगम ने निजी मदद से नदी में क त्रिम फ्लोटिंग द्वीप का निर्माण किया है। इसकी सहायता से पानी के जैविक आक्सीजन डिमांड (बी.ओ.डी.) के स्तर में सुधार हुआ है।

पानी में फास्फोरस और नाइट्रोजन को पुनः चक्रित (रिसर्कुलेट) करके शैवाल की उपज को भी रोका जा रहा है।

यूरेनियम से उड़ने वाला यान बदलेगा अंतरिक्ष विज्ञान की तस्वीर

कार्बन उत्सर्जन शून्य करने के लक्ष्य को पाने के लिए अंतरिक्ष यान की उड़ान तकनीक में भी बदलाव के लिए अध्ययन शुरू हो चुका है। अभी जो यान लिक्विड हाइड्रोजन और लिक्विड आक्सीजन के मिश्रण से बने ईंधन की मदद से उड़ान भरता है, भविष्य में वह यूरेनियम की मदद से उड़ान भर सकेगा। इस दिशा में प्रयागराज स्थित मोतीलाल नेहरु राष्ट्रीय प्रौद्योगिकी संस्थान (एम.एन.एन.आई.टी.) में अध्ययन चल रहा है। संस्थान में एयरोडायनमिक्स पर काम करने वाले बीटेक मैकेनिकल और एप्लाइड मैकेनिक्स के छात्रों की यह तकनीक यदि पूरी तरह से व्यावहारिक साबित हुई तो बड़ा बदलाव देखने को मिलेगा। जो लागत में कमी के साथ स्वच्छ पर्यावरण की दिशा में भी महत्वपूर्ण कदम साबित होगा।



एम.एन.एन.आई.टी. के छात्रों की तरफ से तैयार किए गए अनूठे अंतरिक्ष यान की प्रोटोटाइप डिजाइन

मूलतः बिहार के गया निवासी और अंतरिक्ष यान की प्रोटोटाइप डिजाइन तैयार करने वाले मैकेनिकल इंजीनियरिंग के छात्र श्री विभांशु वैभव ने बताया कि यूरेनियम से संचालित होने वाला यह अंतरिक्ष यान आम यान के मुकाबले तेज और सुरक्षित होगा। इसमें आधुनिक तकनीक का उपयोग किया गया है। विमान में चार पंखुडियों वाले चतुर्गुण ड्रोन का इस्तेमाल किया गया है। यान में बैठा इंसान किसी भी मुश्किल अथवा आपात स्थिति में अपनी जान बचाने के लिए उसका प्रयोग कर सकेगा। यान के ईंधन में बदलाव से यह इकोफ्रेंडली भी माना जा सकता है। एक बार ईंधन भरने के बाद यह अधिक, दूरी तय करने में भी सक्षम होगा। श्री विभांशु वैभव ने यूरेनियम से संचालित होने वाले विमान की डिजाइन तैयार की है। यह ईंधन नाभिकीय विखंडन के सिद्धांत पर बनेगा। इससे एक बार में बहुत ज्यादा ऊर्जा प्राप्त की जा सकेगी और इससे लागत भी कम आएगी

श्री विभांशु ने बताया कि यह अंतरिक्ष यान दिखने में बाज की तरह होगा। इसमें तीन अलग किए जाने योग्य विमान होंगे। इसे विभिन्न आवश्यकता के लिए प्रयोग में लाया जा सकेगा। खास बात यह है कि इस विमान में चार पंख होंगे।

एयरोडायनमिक्स में काम करने वाले मैकेनिकल और एप्लाइड मैकेनिक्स के बीटेक छात्रों की टीम ने मिलकर यूरेनियम से उड़ान भरने वाले अनोखे अंतरिक्ष यान की डिजाइन तैयार की है। वे लगातार वैश्विक पटल पर अपने संस्थान को स्थापित कर रहे हैं।

यान की डिजाइन तैयार करने के लिए छात्रों की दो टीमों के अलग-अलग काम निर्धारित किए गए थे। एक टीम में श्री देवांशु सेठी, श्री आयुष चतुर्वेदी और श्री निलोपल मुखर्जी शामिल हैं। दूसरी टीम में श्री आदित्य सिंह, श्री राहुल मोदी और श्री शिवम औझा शामिल रहे। डिजाइन तैयार करने के बाद टीम ने एनसिस नाम के साफ्टवेयर पर इसका विश्लेषण भी किया। इसके बाद अब अगली दिशा में कार्य शुरू किया गया।

प्लास्टिक के कचरे से तैयार होगा प्लाइवुड का विकल्प

भविष्य में दूध के पैकेट, प्लास्टिक की बोतल, खिलौने व प्लास्टिक के अन्य कचरे से प्लाइवुड का विकल्प तैयार किया जा सकेगा। दावा है कि यह प्लाइवुड से ज्यादा मजबूत होगा। इसे बनाने की तकनीक भोपाल के मौलाना आजाद राष्ट्रीय प्रौद्योगिकी संस्थान (मैनिट) के रसायन शास्त्र विभाग की प्रमुख डा. सविता दीक्षित ने विकसित की है। यह तकनीक प्लास्टिक के पुनः उपयोग में बड़ा कदम साबित होगी। इस वर्ष राष्ट्रीय प्रौद्योगिकी दिवस की थीम भी सुरक्षित भविष्य के लिए विज्ञान व तकनीक के प्रयोग पर है।

डा. सविता दीक्षित ने बताया कि प्लास्टिक के कचरे से ऐसा मैटीरियल तैयार किया जा सकता है जो प्लाइवुड का विकल्प हो। उनके अनुसार वातावरण में कार्बन के तत्व बढ़ रहे हैं। पर्यावरण के लिए खतरा बन रहे दूध के पैकेट, प्लास्टिक की बोतलें और प्लास्टिक के अन्य कचरे को रिसाइकिल कर हम ऐसा मैटीरियल बना सकते हैं जो प्लाइवुड के स्थान पर प्रयोग किया जा सके। इसके लिए एक पालीमर कंपोजिट तैयार किया गया है। इस पर पानी का दुष्प्रभाव नहीं पड़ेगा। उत्पादन लागत भी प्लाइवुड के मुकाबले 10 प्रतिशत तक कम होगी। इस शोध का प्रकाशन अमेरिकी जर्नल एससीआई में किया जा चुका है। इसका पेटेंट भी मैनिट ने करा लिया है।

डा. दीक्षित के अनुसार लगभग दो वर्ष में यह शोध पूरा हुआ है। हर घर से प्रतिदिन दूध के पैकेट, पालीथिन, पानी की बोतलें आदि निकलती हैं जो बायोडिग्रेडेबल (जैविक रूप से नष्ट होने वाली) नहीं होती हैं। ये कचरा वर्षों तक वातावरण में पड़ा रहता है और नुकसान पहुंचाता है। प्लास्टिक की बाल्टी, मग व अन्य सामान भी टूटने के बाद पर्यावरण के लिए खतरा बन जाता है। डा. दीक्षित ने बताया कि बड़ी मात्रा में निकलने वाले प्लास्टिक के कचरे को देख उन्होंने इसके पुनः प्रयोग के लिए शोध आरंभ किया। प्लाइवुड

का विकल्प तैयार होने से लकड़ी बचेगी और पर्यावरण की सुरक्षा भी होगी। इसे बनाने में नारियल के छिलके, पराली, प्रयोग की जा चुकी दवाओं की स्ट्रिप सहित कुछ रसायनों का भी उपयोग किया गया है।



प्लास्टिक से पालीमर कंपोजिट बनाने की प्रक्रिया के बारे में बताती मैनिट की विज्ञानी डा. सविता दीक्षित

डा. सविता दीक्षित ने अलग-अलग तरह के प्लास्टिक अपशिष्ट से प्लाइवुड के विकल्प के 500 सैंपल तैयार किए। दूध के पैकेट और अन्य प्लास्टिक से बना मैटीरियल इन्हीं में से एक है।

प्लास्टिक से बना मैटीरियल प्लाइवुड से ज्यादा मजबूत और सस्ता होगा। इसकी मजबूती (टेंसाइल स्ट्रेंथ) 20 मेगा पास्कल है। यानी इसे लकड़ी के विकल्प के रूप में उपयोग किया जा सकता है। इसका दोबारा उपयोग भी नए सिरे से ऐसा मैटीरियल व अन्य उत्पाद बनाने में हो सकता है। इस कारण यह पर्यावरण संरक्षण के लिए भी उपयोगी है।

नई तकनीक से बने अत्याधुनिक कुओं से लोगों तक पहुंचेगा शुद्ध पेयजल

दिल्ली सरकार ने राष्ट्रीय राजधानी में पेयजल आपूर्ति बढ़ाने के लिए कई अहम कदम उठाए हैं। उच्च भूजल स्तर वाले इलाकों में आरओ प्लांट लगाने के अलावा दिल्ली सरकार ने यमुना के आसपास के इलाकों से भूजल के पानी का इस्तेमाल कर पेयजल आपूर्ति बढ़ाने की दिशा में अनोखी पहल की है। इसके तहत यमुना के नजदीक नई तकनीक से अत्याधुनिक कुएं बनाए गए हैं। इससे पूर्वी दिल्ली के लाखों लोगों के घरों में पीने का साफ पानी पहुंच सकेगा। इसे दिल्ली वालों को 24 घंटे पानी आपूर्ति करने की दिशा में दिल्ली सरकार की एक बड़ी पहल के रूप में देखा जा रहा है।

इसके तहत सोनिया विहार में अत्याधुनिक कुओं का निर्माण हुआ है। इस अत्याधुनिक कुएं का सबसे बड़ा फायदा है कि इससे सामान्य कुएं की तुलना में छह से आठ गुना पानी की आपूर्ति हो सकेगी। खास बात यह है कि इस अत्याधुनिक कुएं के अंदर ही भूजल के पानी को

शोधित करके पेयजल के लिए लोगों के घरों में सीधे आपूर्ति की जा सकेगी। इससे पानी की आपूर्ति 25 से लेकर 30% तक बढ़ जाएगी।

दिल्ली सरकार ने सोनिया विहार में ऐसे 30 अत्याधुनिक कुओं का निर्माण कराया है। प्रत्येक कुएं की क्षमता प्रतिदिन 1.2 से 1.6 मिलियन गैलन पानी आपूर्ति करने की है। इसलिए प्रत्येक कुओं से प्रतिदिन 38 से 48 मिलियन गैलन पानी की आपूर्ति हो सकेगी। इससे पूर्वी दिल्ली के इलाकों में पीने के पानी की समस्या का समाधान हो सकेगा। इन 30 कुओं का निर्माण पायलेट परियोजना के रूप में शुरू किया गया था। इस योजना से स्पष्ट हो गया है कि इसका इस्तेमाल करके पानी की आपूर्ति बढ़ाई जा सकती है। इसलिए दिल्ली सरकार अब ऐसे 70 अतिरिक्त कुएं बनाएगी। ऐसे में अब 100 कुएं हो जाएंगे। इससे प्रतिदिन 120 से 160 मिलियन गैलन पानी आपूर्ति बढ़ जाएगी।

इन कुओं का सिस्टम इस प्रकार से डिजाइन किया गया है कि बारिश के मौसम में ये खुद भूजल को रीचार्ज भी कर सकेंगे। इन कुओं का व्यास एक से डेढ़ मीटर और गहराई 30 मीटर है। दिल्ली में जल बोर्ड के कई रेनी वेल हैं, जिससे भूजल निकालकर लोगों को पेयजल आपूर्ति की जाती है लेकिन रेनी वेल की पेयजल आपूर्ति की क्षमता अत्याधुनिक कुओं की तुलना में कम है। इसलिए अत्याधुनिक कुओं की मदद से जल आपूर्ति में काफी बढ़ोतरी हो जाएगी।

इन कुओं का निर्माण दिल्ली सरकार के जल बोर्ड, लोक निर्माण विभाग और बाढ़ नियंत्रण एवं सिंचाई विभाग के संयुक्त प्रयास से किया गया है। इसलिए इन कुओं का निर्माण दिल्ली सरकार के विभागों के बीच बेहतर तालमेल का उदाहरण है।

International News

Portable Lantern - can be charged by Salt Water or Urine

Colombian renewable energy startup E-Dina developed a wireless lantern, called Water Light, that converts salt water into electricity and is more reliable than solar-powered lamps, a Dezeen article explains. It can also be charged by urine in emergency situations. The portable device acts as a mini generator that produces light using ionization — by filling it with 500 milliliters of seawater, the salt in the water reacts with magnesium and copper plates inside the device, converting it into electrical energy.

The device emits up to 45 days of light and can also be used to charge a mobile phone or another small electrical device via a USB port. The Water Light was created as part of a collaboration between E-Dina and creative agency Wunderman Thompson, which saw

that locals in rural parts of Colombia — specifically, the indigenous Wayúu tribe — were struggling to keep the lights on at night.

Once filled with water, the energy delivery is immediate while solar lanterns need to transform solar energy to alternative energy to charge batteries and they only work if there is sun. Water Light has patented a method that is the first to prolong the effects of ionization, allowing its lantern to produce electricity, and light, for longer periods of time.



A Water Light device can last for two to three years, according to its creators Source: E-Dina WaterLight



Salt Water Lantern (water light)

The device has a cylindrical wooden outer casing and a perforated cap on top that allows water to flow into the device and hydrogen gas from the ionization process to escape. In its entire lifetime, it can produce two to three years of light, or about 5,600 hours, the startup said. The WaterLight project is one of many similar initiatives aimed at giving light to rural global communities. Since

2013, Liter of Light's global initiative has provided communities with "daylight systems" that provide business and light to poor communities. Though WaterLight isn't the first initiative to bring light to poor rural communities, it boasts the advantage that it can generate light almost instantly 24 hours a day.

Infinity Train - The World's First Train, to run on the power of the earth

If you have traveled in a train, then you would know that they run on electricity, diesel or coal. In the beginning the trains used to run on coal, then came the trains running on diesel. But nowadays most of the trains run on electricity. Many advanced technology trains have come around the world which travels in the speed of the storm. But it is surprising to know that now such a train is going to be built, which will not run on diesel or electricity but on the power of the earth. The most amazing thing is that this train will charge itself during the journey.



Infinity Train

According to a news published in the Daily Mail, preparations have started for running such a different type of train in Australia. The name of this train is Infinity Train. It is going to be prepared by the Australian mining company Fortescue. The report of IFL Science says, this train will reduce pollution, in this way Australia will move towards its goal of zero emissions. Actually this train will run on the strength of gravity. The special thing is that running such trains will reduce pollution, apart from this there will be no need for refueling of the train. This special train will get charged automatically while traveling from one place to another i.e. as long as the train continues, the energy of the train will never run out.

The train will have a battery for backup, which will keep charging and will save energy. The energy of this battery will never run out. To charge this battery,

the gravitational force of the earth will be needed the most. Through this project, a good option of freight transportation is to be created at zero emission and low cost. With the help of this train, iron ore can be transported from one place to another at a low cost. When 34,404 tonnes of iron ore will be filled in a 244-coach train and the train returns empty after unloading it, it can be charged by gravity.

According to Elizabeth Gaines, CEO of Fortescue, the 'Infinity Train' will be the world's best, most powerful and capable electric train. This will stop the use of diesel. Many modern cars also have regenerative braking, which generates energy from friction when braking, the same technology will now be used for trains.

"Moss-Growing Concrete" Could Remove More CO₂ and Air Pollution

Researchers have developed a "living concrete" that grows moss, lichens and fungi that could turn city buildings into giant air purifiers. Spanish researchers have developed a porous, acidic concrete that acts almost like soil for moss, lichen, fungi and other drought-tolerant vegetation. They are using the material to construct prototypes of office building capable of sucking more CO₂ and pollution out of the air than thousands of trees, while emitting fresh oxygen for us to breathe.



View of moss growing concrete

A moss-growing bench in London alone does the work of 275 trees, imagine what a whole building made of the stuff can do. That's good news for crowded cities that unfortunately don't have room for large groves of trees. The idea of vertical gardens or "green walls" has been trendy for a couple of decades, but they only exist on about 60 buildings around the world so far because complicated structural engineering is required to attach the plants and soil to the building. "Living concrete" could take the concept of green walls to the next level. It's composed of three layers. The innermost layer waterproofs the building underneath it, protecting

against moisture damage. The middle is the biological, water-absorbing layer, which supports colonization of organisms like moss, lichen, and fungi. And the outer layer is a coating with a reverse waterproofing that allows water to seep in but not out. The vegetation also insulates the building, helping regulate indoor temperatures and further cutting back on emissions from air-conditioners and heaters.

The Line–Brehtaking 170km Long Vertical City at NEOM

Up until now, there has been little update on Saudi Arabia’s proposed smart city Neom but now the country has revealed a sci-fi promotional video of the Red Sea enclave’s forthcoming centrepiece – the Line. Looking like a shining glass wall, stretching 170km across the desert, the Line will take the form of two horizontal skyscrapers running parallel (Globetrender has dubbed it an “earthscraper”), inside of which will be homes for nine million residents.

However, its slender dimensions means it will occupy a footprint of just 34 sqkm, meaning it removes the problem of urban sprawl. Instead, it will spearhead a new concept of “zero gravity urbanism”. Inside will be forests, a marina, parks, schools, offices, a high-speed rail line, a sports stadium and vertical gardens where fruit and vegetables are harvested by robots. Residents will pay a subscription fee to have three meals a day. “The Line is designed as a series of unique communities providing equitable views and immediate access to the surrounding nature at the heart of the globe’s key trade routes. A place for commerce and communities to thrive. The Line – the city that delivers new wonders for the world.” It goes on to say: “The Line’s communities are organised in three dimensions. Residents have access to all their daily needs within five-minute walk neighbourhoods. And the Line’s infrastructure means they will be able to travel end-to-end in 20 minutes, with no need for cars resulting in zero carbon emissions.”

The structure will be 500 metres tall – taller than the Empire State building – but the top will be open to the air. The video states: “By leveraging AI technology, services are autonomous. Intelligent solutions create efficiency and a year-round temperate micro climate with natural ventilation. Energy and water supplies are 100 per cent renewable.” Undoubtedly the most extraordinary proposal for a building on Earth, the Line is being described as the planet’s most liveable city “by far”. The Telegraph says it would be so long that it would even “have to ‘bend to the curvature of the Earth”. But

with little progress to report on Neom since its initial announcement in 2017, will the Line remain a work of fiction? The Guardian reports that Neom says it wants to create 380,000 jobs by the end of the decade “while providing the ultimate work-life balance”.

Prince Mohammed says that phase one of the project, lasting until 2030, would cost 1.2 trillion Saudi riyals (about £265 billion) – quite a large portion of his US\$620 billion (£516 billion) sovereign wealth fund. Ultimately, the Line could take 50 years to complete. He said in a recent statement: “At the Line’s launch last year, we committed to a civilizational revolution that puts humans first based on a radical change in urban planning.”

The designs revealed that the city’s vertically layered communities will challenge the traditional flat, horizontal cities and create a model for nature preservation and enhanced human liveability. The Line will tackle the challenges facing humanity in urban life today and will shine a light on alternative ways to live.

“We cannot ignore the liveability and environmental crises facing our world’s cities and we at the forefront of delivering new and imaginative solutions to address these issues.” Neom said.

“Neom will be a place for all people from across the globe to make their mark on the world in creative and innovative ways. Neom remains one of the most important projects of Saudi Vision 2030, and our commitment to delivering the Line on behalf of the nation remains resolute,” Neom said.

Japan planning to run Interplanetary Trains

Japan is going to create an Earth-like habitable environment on the Moon and Mars. Along with this, interplanetary trains are also going to run to connect Earth, Moon, and Mars. It sounds weird, but it’s true.



Interplanetary Trains

For this project, researchers from Kyoto University in Japan have collaborated with Kajima Construction Company. The team announced plans to develop a 'glass' habitat structure with an Earth-like feature to prevent weakening of the human musculoskeletal system in zero and low gravity environments. Glass will also have an Earth-like environment and gravitational forces. This would make it easier to live in space. Under this plan, it will take about 30 years to prototype glass and inter-planetary trains.

Kyoto University and Kajima Construction Company together aim to create a habitable structure in space. The name of this conical structure is 'Glass'. Artificial gravity, transport system, plants, and water will also be available inside the glass. The goal is to make all the facilities on Earth in space. This structure will be called 'Lunaglass' on the Moon and 'Marsglass' on Mars.

The team will also work on building an interplanetary

transportation system which will be called 'Hex Track'. This vehicle will create gravity like the Earth's surface while traveling long distances. Human beings have to face many types of problems while traveling in low gravity. The trains will also have hexagonal shaped capsules called 'hexacapsules' and a moving device in the middle. Two types of capsules will be made, one for going from Earth to the Moon and the other for going from Earth to Mars. The radius of the lunar capsule will be 15 meters, while the radius of the capsule going to Mars will be 30 meters. This capsule will maintain 1G gravity during the journey.

The station on the Moon will use the Gateway satellite and will be known as Chandra Station, while the railway station on Mars will be called Mars Station. It will be located on the Mars satellite Phobos. According to the Human Space Science Center, the Earth station will be called Terra Station.

Development/ Re-development of Central Vista Avenue

Gopal Varshney

Chief Engineer, CPWD

The Central Vista Avenue – the three-kilometer-long stretch connecting Rashtrapati Bhavan to India Gate is a much loved and precious public space for the people of Delhi as well as for tourists. Located at the heart of our capital, the Avenue is a symbol of our vibrant democracy – a space for all. The Avenue comprises the central road called Rajpath flanked by 70 m wide lawns on both sides, water canals, and rows of trees.

The Avenue was originally designed as a grand processional route to the Viceroy's House (now Rashtrapati Bhavan). After independence, as Indians appropriated imperial spaces and made them their own, King's way became Rajpath and Queen's way became Janpath, Central Vista Avenue became a civic garden and the site for important National Events. The most important of these being the Republic Day Parade.

The Avenue – originally intended as a royal processional axis – was not designed for heavy public use. Over the years, various parts of the Avenue such as the canals, the lawns, Rajpath, and the Avenue's flora, had fallen into dilapidation and disrepair. Central Vista Avenue came under much stress and the inadequate civic facilities like walk ways, street furniture, vending zones, proper lighting, parking and toilets etc. necessitated the re-development.

Additionally, while the Avenue has been the venue for the annual Republic Day Parade since 1951, the event still relied upon make-shift measures for its infrastructural needs. Ad-hoc arrangements and temporary infrastructure that had to be installed and dismantled every year such as make-shift bridges over the canals, temporary parking, and extemporaneous seating and electro-acoustic arrangements for Republic Day Parade, were insufficient, disruptive, and damaging to the landscape of the Avenue.

As a part of the comprehensive Central Vista Redevelopment Project, the government resolved to address this by refurbishing and improving the Avenue and addressing its various needs. The objectives of the Central Vista Avenue refurbishment project are to:

- a) Refurbish, strengthen and restore the Avenue's landscape.
- b) Provide amenities that make the Avenue comfortable for civic users and tourists.
- c) Make the Avenue more pedestrian friendly and easier for traffic to negotiate through.
- d) Provide adequate space and facilities for vendors.

- e) Ensure that arrangements for national events cause minimal disruption.
- f) Ensure integrity and continuity of the Avenue's original design.

These objectives have been met through the following design strategies:

1. Historic chain links and 79 light poles along the Rajpath have been preserved and restored and 58 new poles have been added. Original light poles along Rajpath have also been retrofitted with integrated smart features to facilitate electro-acoustic arrangements for National events.
2. Painted concrete bollards have been replaced with sandstone bollards to achieve coherence with the architectural character of the Avenue.
3. The edges of Rajpath have been paved for pedestrian comfort. A drain channel has been designed along the edge of these pathways for better storm water drainage.
4. Granite has been used on the walkways. The edges of Rajpath (walkways) used to be Bajri / Murram (loose gravel) earlier.
5. The network of pedestrian pathways has been designed such that its junctions are at perpendicular angles. This has been done to reduce wear and tear of the lawns due to pedestrian movement and maintain a complete circuit of pedestrian network.
6. The Avenue lawns have been refurbished with the selection no.1/ Nilgiri species of grass depending upon the shadow/ sunny area.
7. Most of the original Rai Jamun trees have been retained and more trees have been added through a planned strategy of planting.
8. Canals have been refurbished to stop seepage and 60 aeration systems have been added to ensure that the canals have clean water.
9. The currently inaccessible area beyond canal have been activated through the introduction of walkways and sixteen permanent bridges. These also ensure cross connectivity for the lawns on either side of the canals thereby reclaiming the vast area behind canal.
10. The area behind the canals has been designed as a landscaped area that would also function as parking spaces during national events and occasions.

11. Parking has been designed to accommodate up to 1122 cars and 35 buses along with charging points for e-vehicles and a dedicated space for app-based taxi and auto-rickshaw service.
12. Eight public amenities blocks and six vending plazas have been thoughtfully located and designed keeping existing trees in mind. In accordance with the building bye laws of the Central Vista precinct, public amenities have been located below ground level. They will be well lit and ventilated and have been designed to accommodate the expected number of visitors.
13. The provision of a designated space for vendors further ensures pedestrian priority.
14. A total of four pedestrian underpasses – two each at Janpath and C-Hexagon junctions – have been designed keeping pedestrian safety in mind. 8m wide and secure underpasses have been integrated within the original and new rows of trees to ensure a shaded environment and minimum damage to trees in the process. These underpasses were being envisaged by Traffic Police and NDMC since last 20 years to ease the pedestrian traffic on Janpath and C-Hexagon Road.
15. Collapsible bleachers – modular multi-tiered seating system with ascending rows of seats – will be used for seating arrangements during events. This will not damage the Avenue's landscape, reduce installation time, ease transportation, and free up storage space for other preparatory equipment.
16. The precinct around India gate has been refurbished with robust paving, and stepped plazas and amenity blocks – one on each side of India Gate – have been designed for recreational/ cultural public use.

The project work started in February, 2021 and the first phase was completed in time for the Republic Day Parade on the 26th of January 2022. The overall project is targeted to be completed in July 2022. The redevelopment proposal improves the physical aspects of the Central Vista Avenue for everyday use as well as for the many annual and occasional events. It retains the essence of a beloved public space in the heart of Delhi while enabling comfort and ease for its users. It enhances the experience of the administrative and cultural centre of India, keeping the public at the core of its design strategies.

Discovery of “Triangle of Life” in Earthquakes and its role in saving life

Rabinder Shekher

Chartered Engineer; LMIAStructE, LMIBC, LMIRC, MIE

Life is precious and it is thus foremost responsibility of everyone to protect his/her life. We must understand that life has no retake and as such there must be left with no option to try to nurture it. Sir Isaac Newton once said that every day we build many walls for ourselves but are very conservative in having enough bridges. But in my opinion we are very rude in building good walls even. A number of lives are lost every year in manmade structured walls (Houses/Tall structures). We have been witnessing earthquakes and a large number of precious lives are lost. It is not the earthquakes that kill the masses about the structures constructed and designed by the engineers which don't withstand the jerks and jolts of earthquakes and collapse and subsequently kill the people.

An earthquake is a sudden tremor or movement of earth's crust, which originates naturally or below the surface. The word natural is very important here, since it excludes shock waves caused by nuclear tests, manmade explosions and landslides caused by the building work. An earthquake can be linked to the effect observed when a stone is thrown into water pond. After the stone hits the water surface, a series of concentric waves will move outwards from the Centre. The same phenomenon happens in an earthquake. There is a sudden movement within the crust or mantle, and concentric shock waves move out from the point. Geologists and geographers call the origin of the earthquake the focus. Since this is often deep below the surface, difficult to map, the location of the earthquake is often referred to as the point on the earth directly above the focus called Epicenter.

The earthquake produces three types of waves which have their own distinct characteristics and can only move through certain layers within the Earth. The strength, or magnitude, of the shockwaves determines the extent of the damage caused. Two main scales exist for defining the strength, the Meracalli Scale and the Richter scale. The latest earthquake of April, 2015 Nepal earthquake killed more than 8800 people and injured more than 23000. It occurred on 25th of April, with a magnitude of 7.8 on Richter scale. Its epicenter was east of district of Lamjung, and its hypocenter was at a depth of approximately 15 Km. It was the worst natural disaster to strike Nepal since the 1934 Nepal-

Bihar earthquake. The J&K earthquake of 2005 and many more have made people to tremble with the word Earthquake.

The interesting thing about safety from earthquake is that once taught/demonstrated methods about hiding under a table or standing in a doorway or simply 'ducks and covers' when buildings collapse are crushed to death and people who get under objects like desks or cars are also crushed. This is an Eye Opener for the engineers in particular and the public in general today. Shri Doug Copp., a rescue Chief and Disaster Manager of American Rescue Team International, the world's most experienced rescue team has demonstrated the methods of saving the human life by way of different easy and simple tips. He has written an article on earth quakes and titled it "The Triangle of Life". According to him, he has crawled inside 875 collapsed buildings, worked with rescue teams from 60 countries and have worked at every major disaster in world since 1985, except for simultaneous disasters.

In Mexico City during 1985 earthquake, every child in a school was under its desk and every child was crushed to the thickness of their bones. They were probably given demonstrations for the safety against the earthquakes by the authorities but they could have survived by lying down next to their desks in the aisles, A Triangle of Life. Simply, when a structure collapse, the weight of slab, beam etc falling upon the objects or furniture inside crushes these objects, leaving a space or void or A triangle next to them. This space or Triangle becomes life saving space. These spaces are everywhere. The less the object compacts, the larger the void, the greater the probability that the person who is in this void for safety will not be injured. The next time when you watch collapsed buildings on the television, count the triangles, you see formed. It is the most common shape, you will see, in a collapsed structure. All these spaces are lifesaving.

Mind, next time when there is an earthquake, don't duck and cover yourself under the object but just lay down by the object. Let's learn from CATS and DOGS and Babies who often curl up in the fatal position. We should too in an earthquake. Its natural safety instinct. We can survive in a smaller void, hence GET NEXT TO whatever is hard. If you are on the bed and the

earthquake happens during night, just roll off the bed, a safe triangle will exist around the bed and not under the bed. If earthquake happen and you don't get time to come out of building, just curl up and lie down next to sofa, chair or column. Never go to stairs, they have different 'moment of frequency' and are separated from the main building. Don't venture inside the lift, it could land in crash. It is always advisable to get near to the outer walls of the buildings or outside of them if possible. People inside their cars are crushed when flyover above falls over their cars, so get out of your car and lie down aside the car, again the triangle will save you. Copp. has discovered while crawling inside the collapsed news paper offices and other offices with lot of papers that the papers don't compact. Large voids are found surrounding stacks of paper. Large lives were found saved. Doug Copp's theory seems working and so we must work on such practical experiences and develop SOP to identify intervention strategy in a considered way.

We have to learn from our failures. So we must understand our lessons from the earthquakes of India and Nepal. We have to revisit our short term, middle term and long term strategy and our preparedness to ensure minimum damage to life, infrastructure and property. We need to take stock of our buildings, infrastructures, and other assets in an organized way and identify weak links. We will have to develop a standard operating procedure (SOP) to identify intervention strategy in a consolidated way. Broadly we must have to work on STS, MTS and LTS.

Short Term Strategy (STS): We need to communicate the masses in target areas initially in Zone IV & V and explain to them the need to stick to the norms of standard construction of earth quake resistant designs. People at large construct the houses with load bearing walls for their residential purposes, Detailed and exhaustive literature is now available for such construction and is uploaded on internet and EERI, earthquake advising

sites. They need to be read and followed meticulously for such constructions.

Middle Term Strategy (MTS): We need to have a look at the capacity to teach civil engineering at graduate level with quality input and in all probability it would need augmentation. Building bye-laws are to be modified as per the provisions of National Building Codes (NBC-2005). Engineers are to made accountable and as such Engineers bill is to be put on fast track and piloted in the parliament and get it through so that the structures be made by consulting the structural engineers. Ministry of Skill development should pay a pivotal role in imparting skill to labourers and other workers for the safe construction of buildings.

Long Term Strategy (LTS): The research institutes have to look into contemporary work in the field of earth quake engineering in countries like Japan, America and other countries and catch up from that point elevate the level of Phd. Level in IITs and NITs so that the BIS (Bureau of Indian Standard) get adequate input in next few years to generate standards incorporating latest technology for adopting in construction and project management.

Further Research: Base isolation is one of the most popular means of protecting a structure against earth quake forces. It is a collection of structural elements which should substantially decouple a superstructure from its substructure resting on a shaking ground, thus protecting a building or structure's integrity. Base isolation has potential to become one of the most powerful tools of earthquake engineering pertaining to the passive structural vibration control technologies.

These strategies have to be developed and the governments should work vigorously on these concepts but till then a well quote by Stephen Gardiner be remembered "Good Buildings come from Good people and all problems are solved by Good designs".

Reader's Views

1. View dated 15/06/2022 of Ms. Reena Takyar, D/o Late Er. Ved Parkash Takyar (ML-2080) :
"My father who passed away on 10th January, 2022 as an passionate Engineer, about safe buildings and Structures, used to love reading your journals. As a family, we wanted to thank you for your regular updates in the form of journals and more."
2. View dated 13/05/2022 of Ms. Sangeeta Wij (ML- 4013)
"Very interesting information really enjoyed reading it."

Expanded Polystyrene Geofoam Blocks for Use in Buildings

Dr K M Soni
Former ADG, CPWD

Expanded Polystyrene (EPS) Geofoam blocks are normally used with soil in the applications of slope utilization, lateral load reduction in retaining structures, and buried utility protection etc and thus named as geofoam blocks i.e. used with the soil. These can also be used as a structural fill material in civil engineering construction such as bridge column formwork, in wall-forming, stairs, lecture halls, auditorium and stadium seating; and rooftop pool or plaza decks with pavers or cast-in-place slabs. The blocks can also be used for insulation properties.

Physical Properties

As per ASTM D6817, foam control is prescribed as EPS12, EPS15, EPS19, EPS22, EPS29, EPS39 and EPS46 for Geofoam blocks. EPS Geofoam blocks are available in various sizes, generally in 1.2mx1.2m and 1.2mx2.4m but can be manufactured even in large sizes. Thickness of the blocks can be manufactured up to 36 inches. Standard blocks come as rectangles but can be custom cut in the factory to meet various job requirements, including sloped or curved pieces. Additionally, EPS Geofoam blocks are easy to cut in the field, as needed, using saws or a hot-wire cutting tool to install various services or as per the requirements. Typical density of EPS geofoam may vary from 11 to 46 kg per cum as per ASTM C303 for different types of foams hence the blocks are very light and thus suitable for areas where weight reduction is required. Due to light weight, their handling and placing is also easy.

Compressive Resistance, Flexural Strength and Oxygen Index

The compressive resistance of EPS Geofoam blocks ranges from about 15 kPa to 18.6 kPa at 1% deformation as per ASTM D1621 for different types of foams. As long as combined dead/live loads do not exceed one percent strain, EPS Geofoam blocks will not creep or experience plastic yield. Minimum flexural strength of EPS Geofoam blocks vary from 69 kPa to 517 kPa as per ASTM C203. Prescribed minimum oxygen index as per ASTM is 24% by volume.

Water Absorption and Buoyancy

EPS geofoam has a closed-cell structure that limits water absorption. Due to its density being less than

water, uplift forces are to be considered in case of its applications under partial or submerged conditions. Buoyancy can be minimized by installing Geofoam blocks above the water table and ensuring suitable drainage. In case of surcharge from overlying soils or pavements, overburden may be sufficient to offset uplift forces however where uplift forces are significant, anchors or restraining straps may be required to be installed. In case of steps in buildings, such measures are not required.

Durability

Properly selected and installed EPS Geofoam blocks are durable. They do not get decomposed and last for long. It is advisable to cover the blocks and not to keep exposed to sun to avoid degradation. In the steps, they are restrained from displacements by providing GI wire mesh/GI wire fabric which also acts as reinforcement for the concrete being overlaid. EPS is combustible and as such also, it is important to cover it with non-combustible material like cement concrete, RCC, stone or tiles. In case, it is required, fire retardant paint should be applied over such blocks.

EPS Geofoam Blocks Applications in Buildings

EPS geofoam blocks can be successfully used in stairs, seating of class rooms, lecture halls, auditoriums, theatres and stadia and rooftop pools or plaza decks with pavers or cast-in-place slabs. Such blocks have been used in the steps of lecture halls of NISM, Mumbai. After laying the blocks, wire mesh was installed over that concreting was done. Finally flooring was provided. Another advantage of such blocks is that they can be cut in desired shapes to install the services.



EPS Geofoam blocks laid in lecture hall of NISM



Finished lecture hall, NISM

Recommendations for use

When used in the steps, the blocks should be laid as per the requirements of the risers and depth. In case depth is more, required number of blocks can be laid. Thereafter, wire mesh should be used over the blocks to tie them, to keep them in position and also for better bonding with the concrete being laid over the blocks. Concrete in required thickness should then be laid and flooring provided as per the architectural requirements. EPS blocks can also be used in the walls. When used in the walling, particularly in partition walls similar procedure can be adopted except that wire mesh should be provided on both sides of the wall. Another use of such blocks which can be thought is in filling of sunken floors of toilets, kitchen and in similar locations as the material is light, low water absorbent and easy to be

installed. During maintenance period, RCC steps are difficult to be repaired but the steps of EPS Geofoam blocks can be repaired easily.

Reference

<http://www.constructionspecifier.com/white-light-and-out-of-sight-geofoam-applications-for-infrastructure-and-building-projects/>

ASTM D6817, "Standard Specification for Rigid Cellular Polystyrene Geofoam" and ASTM C578, "Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation".<https://www.achfoam.com/ACH/media/ACH/docs/Tech%20Data/Foam-Control-D6817-C578-Summary.pdf>

Reproduced from NBM&CW January 2022 issue

NOTICE

Complaints are regularly received from the members, both individuals as well as Institutional, about the non-receipt of the IBC publications and other correspondence, even though the HQ takes every precaution to send IBC publications to each and every member. It is, however, seen that a large number of IBC publications sent to the members by registered post are returned undelivered to IBC HQ. Similarly, it is believed that an even more number of Built-environment and other correspondence, which are sent through ordinary post, do not reach the intended recipient because of the change in address due to shifting or transfer etc.

Similarly, a large number of information about the IBC activities is sent to the members through e-mail. In this case also, a number of e-mails get bounced due to some reason or the other due to which members are deprived of some important and useful information.

It has, therefore, been decided to update the data base of all such members at the IBC Headquarters.

All such members, who are not receiving the IBC publications or e-mails from the IBC HQ, are, therefore, requested to fill in the following proforma and send it to IBC HQ through e-mail at membership.ibc2022@gmail.com or by post to the Indian Buildings Congress, Kama Koti Marg, Sector-VI, R K Puram, Delhi-110022.

All the Chapter President and Secretaries are also requested to ensure that the form is got filled up by all such members of their chapter.

Regards


(VR BANSAL)
Hon Sec., IBC

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**IBC Welcomes the following New Members enrolled during 31/5/2022 to 01/07/2022
List of New Individual Members**

S.No.	M. No.	Name	Qualification	Designation	Department	City	State
1	ML-9430	Shri Pawan Kumar	Graduate	Partner	Shanti Construction & Company	PATNA	Bihar
2	ML-9431	Shri Praveen Anand	Graduate	Partner	Shanti Construction & Company	PATNA	Bihar
3	ML-9432	Shri Manoj Kumar	M.Tech.	Chief Engineer	Delhi PWD	NEW DELHI	Delhi
4	ML-9433	Ms. Shikha Chaurasia	B.Arch.	Assistant Manager	ICT Pvt. Ltd.	GWALIOR	Madhya Pradesh
5	ML-9434	Ms. Shivangi Sharma	Integrated B.Tech, M.Tech.(Struct.)	Deputy Manager	ICT Pvt. Ltd.	FARIDABAD	Haryana
6	ML-9435	Ms. Smita	M.Tech.(Struct. Engg.)	Deputy Manager	ICT Pvt. Ltd.	NEW DELHI	Delhi
7	ML-9436	Col. A. Mathialagan (Retd.)	M.Tech., MBA	Director	Blue Ribbon QMS	NEW DELHI	Delhi
8	ML-9437	Shri Ashok Kumar Gupta	B.E. (Civil)	Former Superintending Engineer	Rajasthan PWD	ALWAR	Rajasthan
9	ML-9438	Shri Sanjeev Jindal	M.E.	Executive Director	Airports Authority of India	NEW DELHI	Delhi
10	ML-9439	Shri Kunjan Kumar	M. Plan (Hsg.)	Estimating Officer	BCD, Govt. of Bihar	GAYA	Bihar
11	ML-9440	Shri Vikas Kumar Sanehi	B.Com (H)	Director	Dipanshu Promoter & Builder	RANCHI	Jharkhand
12	ML-9441	Shri Arvind Kumar	B.A.	Proprietor	M/s Arvind Kumar	PATNA	Bihar
13	ML-9442	Shri Bhim Prasad		Partner	M/s B.P. Construction	RANCHI	Jharkhand
14	ML-9443	Shri Mohammad Umar		Director	Umar Infrastructure Pvt. Ltd.	RANCHI	Jharkhand
15	ML-9444	Shri Ankit Shishodia	B.Tech. (Civil)	Site Engineer	NHIDCL	GHAZIABAD	Uttar Pradesh
16	ML-9445	Shri Anil Kumar Dondhe	B.E. (Civil)	Deputy General Manager (P)	NHIDCL	HYDERABAD	Andhra Pradesh
17	ML-9446	Shri Deepak Kumar Nayak	B.Tech. (Civil)	Survey Engineer	M/s Chaitanya Projects Consultancy Pvt. Ltd.		Odisha
18	ML-9447	Shri Ankit Jaiswal	B.Tech.	Quantity Surveyor	M/s Chaitanya Projects Consultancy Pvt. Ltd.	LUCKNOW	Uttar Pradesh
19	ML-9448	Shri Jasbir Samal	B.Tech. (Civil)	Graduate Engineer	NHIDCL	BHUBANESWAR	Odisha
20	ML-9449	Shri Khoirom Luckyson Singh	B.Tech.	Assistant Quality cum Material Engineer	M/s Chaitanya Project Consultancy Pvt. Ltd.	IMPHAL	Manipur
21	ML-9450	Shri Rahul Kumar Sharma	B.Tech. (Civil)	Quantity Surveyor	M/s Chaitanya Projects Consultancy Pvt. Ltd.	LUCKNOW	Uttar Pradesh
22	ML-9451	Shri Sanjay Panwar	B.E. (Civil)	Resident Engineer (R.E.)	M/s Chaitanya Project Consultancy Pvt. Ltd.	DELHI	Delhi
23	ML-9452	Shri Sanjay Kumar Sah	B.Tech. (Civil)	Quantity Surveyor	M/s Chaitanya Projects Consultancy Pvt. Ltd.	PATNA	Bihar
24	OM-9453	Shri Narayan Rao R. Maanay	B.E. (Civil)	Trustee & Secretary	B.N.M. Institute of Technology	BENGALURU	Karnataka
25	ML-9454	Shri Vinod Bhai Shittal Shah	B.E. (Civil), MBA, MIE, FIV	Proprietor	S.V. Shah Projects & Consultants	AHMEDABAD	Gujarat
26	ML-9455	Shri Subhash Chandra Sharma	B.Sc Engg.	Former Chief Engineer	DDA	GURUGRAM	Haryana
27	ML-9456	Shri Balbir Singh Sahni	B.Arch.	Architect	M/s Shipli	UJJAIN	Madhya Pradesh

28	ML-9457	Shri Tikam Singh Mangal Bhandari	Post Graduate-IIMT	Senior Planning Engineer	MCWAYManagements Ltd.	GANDHINAGAR	Gujarat
29	ML-9458	Shri Kishore Kumar Sharma	DCE & AMIE	Superintending Engineer	HP PWD		
30	ML-9459	Shri Umesh Sharma	B.Tech., MBA	Executive Engineer	HP PWD	NEW SHIMLA	Himachal Pradesh
31	ML-9460	Shri Ravi Singh Rana	Graduate Engineer	Executive Engineer	HP PWD	MANDI	
32	ML-9461	Shri Sanjay Kumar	B.Tech. (Elect.)	Superintending Engineer (Elect.)	HP PWD	MANDI	Jharkhand
33	ML-9462	Shri Ramesh Kumar	B.Sc. Engg. (Civil)	Executive Engineer	RCD, Govt. of Jharkhand	RANCHI	
34	ML-9463	Shri Deepak Sharma	B.E. (Civil)	Chief Engineer	HP PWD	SHIMLA	
35	ML-9464	Shri Deva Nand	M.Tech. (Civil Engg.)	Executive Engineer (Civil)	HP PWD	HAMIRPUR	
36	ML-9465	Shri Vivek Gupta	Graduate Engineer	Assistant Engineer	HP PWD	SHIMLA	
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44	ML-9473	Shri Lalit Kumar Grover	AMIE, MBA Finance	Executive Engineer	HP PWD	SHIMLA	
45	ML-9474	Ms. Neelam Gupta	B.E. (Civil)	Executive Engineer	HP PWD	SHIMLA	
46	ML-9475	Shri Rajeshwar Singh Jaswal	Post Graduate Engineer	Executive Engineer	HP PWD	SHIMLA	

List of New Institutional Members

S.No.	M. No.	Name of Organisation	Field of Activity	Name of representative	Designation	City	State
1	IM-90211	Madhya Pradesh Building Development Corporation Ltd.	Planning, Design & Construction of Government / Public Building like Hospital, School Educational Institutions etc.	Shri Rakesh Kumar Agarwal	General Manager	Bhopal	Madhya Pradesh
2	IM-90212	FR Engineering Solution	Engaged in Prestressed / Post Tensioning Building Design & Execution of Post Tensioning Work, Building Repair and Rehabilitation	Shri Prathamesh Lakde	Proprietor	North 24 Parganas	West Bengal

From Editor-in-Chief Desk

International Building Code (IBC)

In USA for building construction and repair, International Building Code, is followed. This code is followed by Caribbean Countries and Latin American Countries. Therefore, word International is justified for the American code. In this code preferential treatment for specific materials and methods of construction, have been avoided. This code is followed by all Government Agencies as also private parties including those involved in residential building construction. The code is controlled by officers of the Government with experience and expertise in this field.

The International Building Code came into existence during the year two thousand. Before hand there were three regional model codes and different states adopted different codes. These codes were (i) Building Official Codes Administration International, (ii) Standard Code for Southern Building Codes congress and (iii) Internal conference of Building officials. During 1994, these councils merged and formed International Code Council (I.C.C.). There were several other developments during this period in the world which include North American Free Trade Agreement, formation of European Union and its effects, Europe as a Single market. The I.C.C. developed this International Building Code and first published during 2000. While drafting this code, they were well aware of the fact that code was for International Community.

The IBC also refers to other codes like International Plumbing Code, International Mechanical Code, National Electrical Code and National Fire protection standards. If any Municipality adopts National Building Code, it also adopts other codes simultaneously.

The IBC contains useful information for building professionals. Important subjects included in the codes are (a) Building Occupancy Classification, (b) Height and areas, (c) Interior finishing (d) Materials used for construction (e) Fire Protection Systems (f) Foundation, walls and roof (g) Elevation and escalators (h) Already existing structure and (i) means of egress. These means of egress include, exit during emergency – path, travel to exit, exit and safe area outside. It also includes accessibility for physically challenged people (not termed as handicapped), to all places.

This code is updated every three years and latest code published in the year 2021. This code relies on other standards like ASTM.

(Link-https://n.wikipedia.org/wiki/international_building-code) and discussion with professionals.



(K.B. Rajoria)



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