

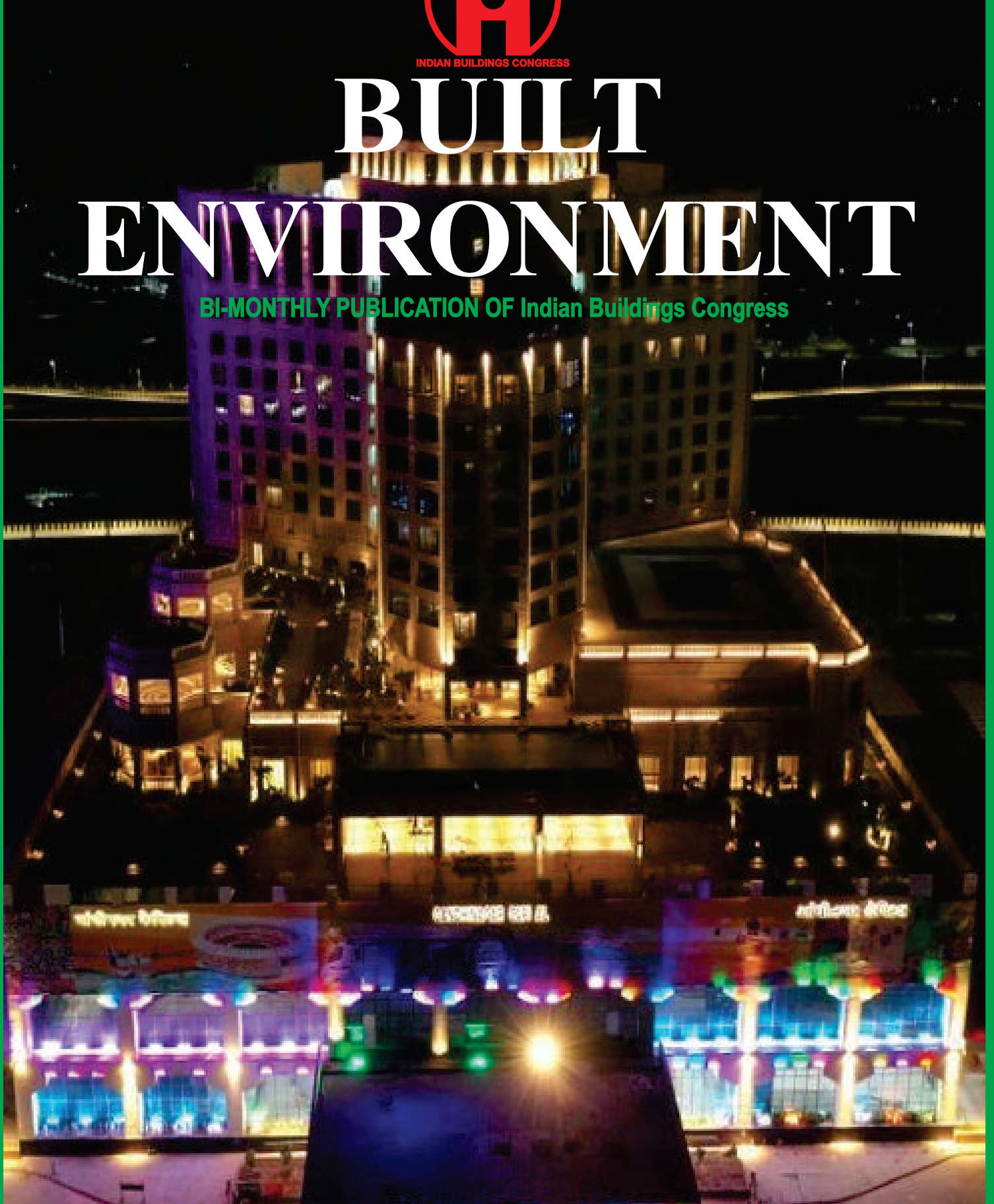
Vol.7 Issue 2
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July-August, 2021

BUILT ENVIRONMENT

BI-MONTHLY PUBLICATION OF Indian Buildings Congress



SPECIAL ISSUE - MID TERM SESSION AND NATIONAL SEMINAR

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From President's Desk



Dear Readers,

It is important to note urbanisation is an inevitable process and urban areas will continue to grow demographically and spatially. Cities- considered engines of growth, contribute more than 65 per cent of the national gross domestic product and provide employment to more than a third of the country. The collateral damage emerging out of these expanding cities is the result of a breakdown in natural systems besides other damages. Urban areas generate high volumes of polluted run-off, often resulting in the breakdown of the urban drainage system. In such a case, even moderate rainfall events can lead to flash floods in low-lying areas and can overcome drainage systems of cities.

Whenever monsoon season arrives it brings greenery, relief from the scorching heat, relaxation, and a box full of questions on account of water logging. During monsoon, waterlogged roads, traffic jams, potholes, etc. are now becoming inevitable like lightning and thunder. Every year, metro cities face this worst side of monsoon, where concreted surfaces fail to absorb stormy water that causes water logging on the roads. Unlike urban areas, soft earth and trees play a vital role in absorbing every single drop of water in the woodlands. Even after building huge infrastructure like – skyscrapers, parks, and flyovers, the question still remains the same, why there is no permanent solution to water logging?

Primarily a drainage system is built to keep rainwater off the roads but today due to lack of attention of civic bodies, drains are getting clogged as they are not in proper shape. Disposal of kitchen and home waste, fallen dried leaves, debris, broken garbage collection, plastic, and other garbage directly into the drains is the major factor of drain clogging that further results in water logging on roads. In many cases, waste flowing through drainage pops out, which results in a stinky odour on the streets. This is very common in cities near the coastline as during rain and high tide water enter back into the cities through the drains. The people gets confined to their houses.

Keeping the drains clean and maintaining proper garbage disposal is one of the key responsibilities of the municipality of any city. But as usual, they fail to perform these indispensable tasks every single year. Apart from this, solid wastes caused due to under-construction projects and plastic wastes are also causing severe damage to the drainage system. We all know that major share of problem of water logging is due to human negligence as compared to minor share of heavy rains which should be welcomed for balancing the nature. This human negligence adversely affects the health of both the environment and the city.

Now the question is, what can be done for the betterment of life out there in cities? The action for flood management needs to be taken by the Municipalities/Authorities responsible for maintaining drainage system with the active participation of the Citizens. We as responsible Citizens can do our bit by restricting ourselves from disposing of waste into drains, especially plastics, making optimal use of dustbins, and following the government's waste disposal system respectively. We can also initiate a drive of tree plantation which is the best and the oldest method to control things like floods and water logging. Strategically planting of trees in particular areas will be beneficial for all.

(Pradeep Mittal)

Mid-Term Session and National Seminar on “Green and Energy Efficient Buildings” Inaugural Session



Shri Sanjeev Mittal, Member (Infrastructure), Railway Board & Ex-officio Secretary to Govt. of India, the Chief Guest Being Welcomed by Sh. Pradeep Mittal, President, IBC

The IBC Mid-Term Session and National Seminar on “Green and Energy Efficient Buildings” was held in IBC Head Qtr. Building at New Delhi on August- 18, 2021. The inaugural Function of the Mid-Term Session

Guest of the function. Besides the Chief Guest, Shri Pradeep Mittal, President, IBC; Shri O.P.Goel, Founder President, IBC & Former DG(W), CPWD; Shri R.N.Gupta, Vice President, IBC & CMD Ramacivil India Const. Pvt.



Dignitaries on the Dais

and Seminar was held on August 18, 2021. Shri Sanjeev Mittal, Member (Infrastructure), Railway Board & Ex-officio Secretary to Govt. of India, was the Chief

Ltd., and Shri H.P.Gupta, Honorary Secretary, IBC were present on the dais. All the dignitaries on the dais were welcomed by presenting bouquets.



Lighting of Ceremonial Lamp

The Inaugural Function started with lighting of the Ceremonial Lamp by the Chief Guest Shri Sanjeev Mittal, Member (Infrastructure), Railway Board & Ex-officio Secretary to Govt. of India, who was joined by Shri Pradeep Mittal, President, IBC; Shri O.P. Goel, Founder President, IBC; Shri R.N.Gupta, Vice President IBC; Shri B.Majumdar, Past President, IBC; Shri Shobhit Uppal, Past President, IBC; Dr. P.S.Rana, Past President, IBC; Shri Krishna Kant, Chairman, Technical Committee, IBC; Shri V.R.Bansal, EC Member, Shri Sanjeev Kumar Lohia, EC Member and Shri G.P.Mathur, G.C. Member.

Presidential address was delivered by Shri Pradeep Mittal, President IBC. In his address, the President, welcomed and thanked the Chief Guest, Shri Sanjeev Mittal, Member (Infrastructure), Railway Board & Ex-officio Secretary to Govt. of India for sparing his valuable time from his busy schedule for consenting to become Chief Guest of the function, other dignitaries on the Dais; all past Presidents; EC & GC members; all author of papers and all participants who had come physically to attend the Mid-Term Session and Seminar as well as those participants who had joined on virtual platform.



Presidential Address by Shri Pradeep Mittal

He informed that planning and construction of green and energy efficient buildings alongwith ancillary infrastructure to meet the huge demand due to exponential growth of population without damaging the environment is a big challenge before the planners and engineers. On account of construction of buildings, forest and agriculture cover is reducing and natural resources of raw materials are depleting fast due to mining of raw construction materials leading to pollution of the environment. Huge energy is consumed in manufacturing of cement, steel and other construction material which contributes heavily in carbon foot print. The purpose of development is to meet the basic needs of the humanity, improve the quality of life for all and ensure a secure future. He mentioned that nature as a whole, the earth and all life system should be respected and taken care. He stressed the need to focus on systematized urbanization and integrated development with a co-ordinated approach by involving together Architect, Structural Engineer, Construction Engineer, specialists of all disciplines of services involed in the building and automation Engineer from the initial stage of planning and designing for adhering to the principles of Green and Energy Efficient Buildings. Shri Mittal added that the ancient Indian architectural literature provides enough evidence of concern for environment and nature. The traditional buildings of the past have in built thermal comfort property and were based on climate responsive integrated passive design approach. It would still be possible for modern designers, architects and engineers to incorporate these design principles in the buildings by optimum use of locally available materials and good foresight in planning. He desired the construction industry to arm it with new age capabilities, innovative technologies in planning and construction of

buildings and infrastructure and at the same time not compromise on quality, safety, healthcare and above all in conserving the environment.



Shri O.P. Goel, Founder President Addressing the Gathering

Shri O.P. Goel, Founder President, IBC in his address while welcoming everybody present in the Seminar briefed about how the IBC was informed and its journey since inception. He lauded the role of IBC in its contribution towards promotion of built environment which is sustainable, affordable, green and energy efficient. He desired for use of construction materials with minimum embedded energy, placement and planning of the buildings in such a way that minimum energy is used and the energy used is also produced from renewable sources like solar, wind etc. He expressed his happiness over joining the Seminar physically and wished success of the Seminar.

Shri Sanjeev Mittal, Member (Infrastructure), Railway Board, the Chief Guest of the function, addressed the gathering. In his address he informed that the Indian Buildings Congress has selected "Green and Energy Efficient Buildings" as theme of this Mid Term Session and Seminar in order to draw attention of all concerned with built environment on this vital topic. The world is currently undergoing the largest wave of urban growth in human history. More than half of the global population is now concentrated in urban areas which will increase to two third by 2060. He mentioned that India is committed to work towards meeting the 17 'Sustainable Development Goals' set by the United Nations where SDG 3,6,7,11,12 & 13 pertains directly to Green Building and their sustainability. He mentioned that massive focus is required to be given on improving the sustainability performance and reduce the carbon



Shri Sanjeev Mittal, Member (Infrastructure), Railway Board & Ex-officio Secretary to Govt. of India, Addressing the Gathering

foot-print of buildings. He desired the construction industry for compliance of Green building standards and sustainability goals by looking differently in considering the entire life cycle cost of the building rather than initial cost. He mentioned that most important sustainability principles and requirements of Green and Energy efficient Buildings should be addressed right from the planning and inception stage and not looked upon as an add-on or retrofitting later-on. He added that Indian Railways has taken up a massive programme for redevelopment of 200 railway stations across the country in next three years which are to be developed on green building and sustainability development principles. He also underlined the importance of Indian Buildings Congress in promoting green and energy efficient buildings. In the end he hoped the seminar will generate sufficient interest among the professionals and come up with positive and practical recommendations for making Green and Energy efficient Buildings an essential and integral part of Built Environment.





Preliminary Publication being released by Chief Guest

To mark the occasion, Chief Guest released the Preliminary Publication containing 12 technical papers to be presented in the Seminar. IBC Memento was also presented to the Chief Guest.



Shri Sanjeev Mittal, Member (Infrastructure), Railway Board & Ex-officio Secretary to Govt. of India, being presented IBC Memento by Shri Pradeep Mittal

Technical Session 'Green and Energy Efficient Buildings'



**Shri Atul Kumar Garg, Chairman and Shri I.S.Sidhu,
Co-Chariman (L to R)**

General

The Technical Session of the Seminar was held in Seminar Hall of IBC Head Qtr. Building at New Delhi on August 18, 2021. Shri Atul Kumar Garg, Former Chief Engineer, CPWD was the Chairman of the Session and Shri I.S.Sidhu, Head (Northern Region), KITCO Ltd. was the Co-Chairman of the Technical Session.

The Chairman and Co-Chairman were welcomed by big round of applause. Thereafter, Chairman was requested to proceed with the Session. The Chairman, Shri Atul Kumar Garg welcomed the delegates and authors. After giving brief remarks about the necessity of Green and Energy Efficient Buildings, he invited speakers to deliver their presentations.

Papers Presented

First paper was presented virtually by Shri Jit Kumar Gupta, Founder Director, College of Architecture, IET Bhardal, Chandigarh on 'Strategies for Making Buildings Green and Energy Efficient'. In his presentation the author informed the audience the need of paradigm shift on the part of construction industry which should look at the options to rationalizing the pattern of designing buildings, relevance of site and orientation, options for energy and water efficiency, building materials and indoor air quality to make buildings green and energy efficient. He mentioned the importance of making building climate responsive. He also explained the need of reduction of embodied as well as operational energy

components for making the buildings energy efficient. He further added that need of designing a appropriately and optimum sized /energy efficient and rated lighting/heating/cooling system in a thermally efficient building will be the pre-requisite to make the building green. Materials used in the buildings should essentially be resource efficient, natural, plentiful, renewable, energy/water efficient, environment responsive, non-toxic, affordable, recyclable, locally available, easily salvaged, refurbished and remanufactured, made from industrial/ agro waste and durable.

The next paper was presented virtually by Shri R.B.Gautam, S.E./PM, MES, (MAP), Bathinda, (Punjab) on 'Recent Trends in Planning, Design, Construction, Operation and Maintenance of Green and Energy Efficient Buildings'. In his presentation, Shri Gautam expressed the need of integrated approach in a co-ordinated manner by all the disciplines responsible for construction of Green building and ensuring optimum level of energy efficiency. For taking advantage of the climatic effect he has stressed the need of solar passive design of buildings. He has discussed direct heat gain, thermal storage walls, evaporative cooling, passive desiccant cooling, induced ventilation, earth berming, wind towers, earth air tunnels, curved roofs and air vents technologies which can be incorporated according to the requirement of the buildings. He explained that sustainable building and services is the best option for energy security, future growth, clean air & water, easy transport management, sanitation, solid waste management, generation of employment in India

The next paper was presented physically by Dr. K. M. Soni, Former Addl. DG, CPWD, Delhi, on 'CPWD Green Rating Manual-2019 and its Provisions'. Though his presentation was scheduled on CPWD Green rating manual 2019, however due to publication of latest CPWD Green Rating Manual 2021, he made his presentation on the latest manual. In his presentation Dr. Soni explained the 9 criteria of Architectural Planning & Design, Quality and Safety, Sustainable Building Materials, Green Construction measures, Water Conservation measures, Energy efficiency and conservation, Waste management, Welfare measures and Landscape and Horticulture for evaluation and broadly assessing the Green rating of Building based on the score awarded to the building. The Manual provides for rating of buildings as Green, Green Plus and Super

Green based on green and sustainable development concepts. He also informed that the rating of Buildings graded by CPWD is valid for five years.

The next paper was presented by Dr. Pradeep Kumar Gupta, Prof. Civil Engg. Department, Punjab Engineering College, Chandigarh on 'Study of Features and Future Prospects of Net Zero Energy Building –A Case Study'. In his presentation Shri Gupta explained net zero energy building concept for generating green energy in the buildings to meet its energy demand and for making the building green and more sustainable. The necessity of encouragement of all the stake holders has been explained by him in this direction. He suggested installation of 'Solar PV's and Solar Panels' on facade and roofing top of buildings for onsite generation of energy. He has beautifully explained the types of Green building materials and design aspect of green buildings; He mentioned that the success of construction of a green and energy efficient building depends upon the active participation of everyone who has a hand in the process.

The next paper was presented physically by Shri A.K.Jain, Former Commissioner (Planning), DDA on ' Covid -19 and the Concepts of Green and Hygienic Buildings'. Giving reference of the present situation of Pandemic of COVID 19, Sh. Jain in his presentation informed the need of going beyond using the energy, water, building resources and materials more efficiently. He expressed the need of buildings to be more healthy and hygienic to the users/ occupants. He suggested the need of linking the buildings more closely with the livelihood, jobs and health parameters. He further added for creating enough space in accommodations for maintaining social distancing norms and for self isolation needs, access to tap water and washrooms/ latrines. He suggested for integration of at least 50 % of the built space into work from home facilities and for reduction of distance between work and living for convenience of mobility of the individuals so as to solve many issues of environmental pollution due to traffic. Constructing buildings which work as bio-reactors and energy generators can go a long way in achieving green and energy efficient buildings. His suggestions for adopting multilevel platforms for urban agriculture along with micro irrigation facilities can certainly help in making available organic produce/ vegetables locally which will not only reduce pollution due to haulage of

agriculture produce but will also add to the greenery amid concrete jungle.

The next paper was presented virtually by Dr. Mutyala R. Prakash, Director, Institute of Development Planners and Researchers, Gandhi Nagar (Gujarat) on 'Green and Energy Efficient Tall Buildings'. In his presentation he explained the complexity of construction of tall buildings from its excavation stage to completion and the challenges faced by the Architects & Structural Engineer and taking a balanced view in installations/ fixing of the additional outfits for producing energy from sky scrapers by maintaining the beauty and aesthetics of facades. He also explained the need to adopt the energy saving technologies by integrating different type of uses of energy in sky scrapers.

The next paper was presented physically by Dr. J.Bhattacharjee, Former Advisor, Amity University, Noida (U.P.) on ' Utilisation of Green Building Materials for Sustainable Development in India'. In his presentation Dr. Bhattacharjee explained the need to plan and design a building in a environment responsive way and use of design and materials that are environmental friendly for ensuring pollution free environment. He advocated the application of smart energy management, integrated building management system, solar photovoltaic system, high performance windows and heat resistant paints. He expressed the need to create processes that links the built environment with the human health and comfort, water, energy, biodiversity and other natural resources so as to use less energy & water, generate less green house gases, use materials more efficiently and produce fewer wastes than conventional buildings over their life cycle.

The next paper was presented virtually by Dr. Deepak Sundrani, Sr. Associate Professor, NICMAR, Pune on 'Green and Energy Efficient Buildings: A case study of Suzlon one earth, Pune'. In his presentation Dr. Sundrani explained the use onsite technologies of PV system and Bio mass + off-site micro wind green energy generation, use of cavity walls, 100% shading of windows glazing during summer, natural ventilation, optimising in building design to have more than 75% regularly occupied day lit spaces, high performance glazing, efficient lighting design, energy efficient HVAC system, regular energy performance monitoring,

low embodied energy materials use in construction, solar water heating system, adoption of technologies in reduction of water requirement for construction and operation of building and landscape, recycling, recharge and reuse of water, waste management etc. in the building studied which made it a remarkably Green and energy efficient building. He informed that by use of these techniques, the building has achieved LEED Platinum level certification standard (56 out of 57 points) and TERI GRIHA 5 Star certification.

The next paper was presented physically by Shri Ram Babu Prasad, Executive Engineer, BCD, Patna, Bihar on 'Construction of Buddha Samyak Darshan Sangrahalaya and Smriti Stupa at Vaishali, using Green and Sustainable Construction Techniques'. In his presentation Shri Prasad explained the planning and designing of the project keeping the local environment in mind with the key concepts of creating an energy efficient, environmentally friendly structure. By keeping the smaller foot print of the building (only 6% ground coverage has been planned) will result into use of fewer construction material, green estate without disturbing the surrounding. Excavated earth will be retained and re-used. The Stupa building is a unique semi spherical hollow dome, to be constructed in dry stone masonry having minimum embodied energy. The Museum blocks have been planned with petal shaped roof design symbolic to nature. Considering the large volume of dome, cut outs and small openings are provided for natural ventilation for cooling and diffuse light thus creating healthy environment inside the stupa and saving huge energy. Keeping Stupa in the center of the site, five circular gardens are projected out. Large land parcels have been kept free on exterior portions of site in all directions to create harmony with the rural context of the site. The landscaping in the site is merged with the elevated pathway for the pedestrian movement with earth berm on either side. The use of non-toxic materials, combined with natural ventilation and effective air filtration have been planned which will help improve indoor air quality in the museum building specifically. The controlled indoor moisture levels will protect users from mold, chemicals, combustion by-products and other indoor pollutants.

The next paper was presented virtually by Shri V.Srinivasan, Principal Scientist, Advanced Materials

Laboratory, CSIR- Structural Engineering Research Centre, Chennai on 'Sustainable Construction Using Recycled Concrete Aggregates'. In his presentation Shri Srinivasan explained the environmental, social and economic challenges posed by the construction and demolition waste. He detailed the enormous C&D waste generated in few selected cities where it has become a huge problem of disposal. He explained various techniques through which the C & D waste can be recycled as raw materials to reproduce building materials or other products.

The last paper was presented virtually by Dr. Indrasen Singh, Sr. Professor and Dean, NICMR Goa on 'Solutions For Pure Water in Sustainable Development of Green Buildings'. In his presentation Dr. Singh explained the necessity of treatment of surface and ground water for ensuring good public health. Water drawn directly from rivers, lakes, or reservoirs is rarely clean enough for human consumption. Even water drawn from underground aquifers often requires some degree of treatment to render it potable that is suitable for drinking. The author explained the maximum contaminants limit (MCL) and maximum contaminant limit goal (MCLG) for organic chemicals as well as MCL of the inorganic chemicals present in drinking water. He has also brought out various water treatment processes to make the water potable.

Certificates of Participations were given away by the dignitaries at the venue to the authors who presented their papers physically at venue, However, the certificate of participation to those authors who presented their papers on virtual platform will be sent through post in due course.



Certificate of Participation being given to Dr. K.M. Soni



Certificate of Participation being given to Shri A.K. Jain



Certificate of Participation being given to Dr. J.Bhattacharjee



Certificate of Participation being given to Shri Ram Babu Prasad

Summing UP

Summing up of the papers presented in the technical session was done by Shri I.S.Sidhu, Co-Chairman of the Session. He mentioned that each of the eleven papers presented including three case studies were well documented, structured and informative. Case studies are very much relevant in present day scenario and need

to be replicated. Case study of 'Buddha Samyak Darshan Sangrahalaya and Smriti Stupa at Vaishali' has very well outlined the use of stone masonry which needs to be adopted in a big way by professionals, being time tested construction technology. Due to rapidly expanding ICT Sector and advent of smart buildings, the role of IT professionals has become equally important among other built environment professionals in building industry. For workers engaged in maintenance of Green and Energy efficient buildings, he expressed the need of Manual for training and skill development along with Operation and Maintenance Manual of such buildings. He emphasized the need of proper space planning in the Built Environment to take care of Covid-19 like unforeseen situation to maintain building hygiene, social distancing as well as to work from home. He added that while constructing green and high rated highly energy efficient buildings, it is equally important to see their linkage with off-site infrastructure like water, power, traffic management etc., which is not adversely affected.

The Session was declared closed by the Chairman with the appreciation of authors.

IBC Congratulates



Shri Shailendra Sharma on taking over the Charge of Director General, CPWD on July 31, 2021. Before elevation on the post of D.G., CPWD, Shri Sharma has worked in different capacities in CPWD including Engineer Member of DDA. He is responsible to the Ministry of Housing and Urban Affairs for efficient administration and overall professional control of public works within the jurisdiction of CPWD.

Recommendations



**Shri M.C. Bansal, Chief Rapporteur & Advisor (Tech.), IBC
Presenting the Recommendation of the Seminar**

The following recommendations emerging out of the papers accepted, presentations made and discussions held during the Technical Session were read out by Shri M.C.Bansal, Chief Rapporteur and Advisor (Tech.), IBC at the end of Technical Session held on August 18, 2021.

1. Thrust should be given to improve the rural economy by way of rural development so that the densification of cities and towns leading to environmental degradation, huge carbon emission, greenhouse gases and pollution, could be controlled due to migration of rural folks in search of employment and better life standard.
2. Construction of Green and energy efficient buildings should be encouraged by the Government by giving suitable tax benefits to owners as well as developers.
3. Government should support research education at university level and should launch awareness campaign by making mass publicity amongst the masses through various modes of media like news papers, articles, TV, Radio etc. about green and energy efficient buildings. Green and Energy efficient Buildings should become a Jan-andolan.
4. Procurement policies of the Government and different organisations are generally based on lowest initial cost. Suitable procurement methods should be devised using 'Life Cycle Cost' Principles.
5. Energy is being given to some section of society either free or at subsidised concessional rates resulting into more wastage of power since there is no motivation to save energy. Such measures should be minimised or discontinued in the larger interest of society.
6. There should be a Statutory Act providing for integrated approach in co-ordinated manner by all the involved disciplines for planning, designing, construction, operation and maintenance of a green and energy efficient building for ensuring reduction in green house gases, carbon foot print, energy consumption, environmental degradation, water and air pollution, generation of waste, water consumption in Building industry to take advantage of the opportunities that such synergies offer.
7. For achieving well integrated and co-ordinated approach the owner of the building should be held accountable for involving together all the necessary disciplines like Architect; Civil; Electrical; Mechanical; Air-conditioning; Telecommunication Engineer; Fire detection and protection specialists; Acoustics and Sound engineers; Water supply and Sanitary specialists; and user specific other services specialist from the initial stage while evolving an energy efficient conceptual design.
8. The Green and energy efficient building parameters should be made part of Building Bye-laws for strict-compliance. In the event of non-compliance of these parameters, approval of building drawings and completion certificate should not be issued by the Local Bodies.
9. Delay in permission to start the Building Projects under the disguise of environmental clearance should be avoided and efforts should be made to give single window clearance at the level of the authority responsible for giving clearance.
10. There is a need of paradigm shift on the part of construction industry for redefining and changing the traditional approach to buildings. Rational and innovative site planning and building planning holds great bearing on making buildings green.
11. The detailed study and analysis in terms of; location, orientation, wind direction, accessibility, size, shape, soil conditions, topography, vegetation, natural

- features, hydrology, precipitation, infrastructures etc. should be done before hand while planning. Based on such analysis coupled with physical characteristics such as slope, surrounding land uses/buildings, visual linkages, the green building design should be prepared.
12. Environmental impact assessment of building project should be done at initial stage to prevent environmental damage during construction; occupancy; Operation & maintenance and finally at the time of demolition when the building completes its age. All necessary measures as recommended in the EIA should be put in place.
 13. Principles governing the site planning like minimizing footprints of buildings; placing of uses/ spaces; maximizing open spaces; minimizing damage to site; designing with local culture; promoting pedestrianisation and using hierarchy of preservation, conservation and regeneration; shall be followed in designing as these holds great relevance in making buildings green and energy efficient.
 14. The Design of the building should be able to facilitate the future changes with minimal impact on building support systems and with very little waste.
 15. While planning and designing of building the target should be construction of net zero or energy positive building for its complete life cycle through conservation and generation of energy by way of non-conventional source of energy like installation of roof top or surface mounted Solar panels, Building integrated Photo Voltaic (BIPV), Wind Mills, Bio-mass, Geo-thermal etc. Near the sea shores energy parks can also be established to harness the tidal and wave energy.
 16. For saving energy, minimizing the carbon emission and reduction of pollution, the building projects should be located within easy access of public transport, educational; medical; shopping and recreational facilities.
 17. By providing pedestrian friendly paths in the habitat, walking and bicycling should be encouraged.
 18. Environmental life cycle analysis of the product should be carried out before selection of the product for green buildings. The material having least embodied energy should be planned for use in the building.
 19. As far as possible locally made materials like stone aggregates, bricks, precast wall panels etc. should be used.
 20. To the extent possible, maximum building elements should be manufactured offsite and delivered to site to minimize noise, dust and waste pollution, maximizing recycling, high quality elements and better OHS (Occupational health and safety management system) management.
 21. A proper construction waste management plan should be drawn and enforced to effectively and economically collect, segregate, reduce, recycle, reuse and dispose of all unusable construction waste, and debris generated in the construction, operation and maintenance of the building project.
 22. The installation of non- conventional renewable, properly sized / energy-efficient and rated lighting/ heating/cooling systems in a thermally efficient building should be pre-requisite to make buildings green and energy efficient.
 23. The strategy to involve daylight harvesting; smart metering; advanced lighting controls- motion sensors/ dimmable lighting controls; promoting operational /maintenance efficiency through BMS (Building Management System) etc., besides computer modeling for optimizing design of electrical/ mechanical systems should be adopted.
 24. For ensuring minimum energy consumption in all activities and maximum consumer satisfaction, all services in the building should be integrated to the microprocessor based 'Energy Management System' (EMS) for cohesive and reliable hands-free operation with minimum human interface.
 25. At construction site, dust mitigation measures should be adopted by use of recycled/ storm water in various activities like cleaning/washing of concrete mixers & tyres of materials carrying vehicles, cutting of stone and tiles, rubbing and polishing of stone flooring. For efficient use of water ready mix concrete and chemical curing or some efficient curing system should be used.

26. Sensor based urinals, standard low flow fittings in toilets and lavatories should be used. Aerators and flow restricting nozzles, faucets and showers are very useful for making the facility more water efficient.
27. Dual plumbing should be implemented in construction so that recycled water or grey water system could be used for toilet flushing or other non-potable use. Waste water should be minimized by reusing in flushing of toilets.
28. Technology for high efficiency irrigation with recycled/ storm water, should be provided for native and adopted plants in the landscaped area.
29. For ensuring fatigue free; better health free from environment related ailments and improved work performance of the occupants, good internal air quality inside building should be maintained by ensuring good day light, efficient ventilation, use of non-toxic materials, damp free surfaces besides using indoor plants.
30. Regular maintenance as well as technical and energy audit needs to be done for buildings to ensure that water and energy management aspects do not get deteriorated during actual operation. It should be made mandatory to make periodic technical and energy audit for all buildings consuming energy above threshold limit.

At the end of the Session, the President, IBC thanked the Chairman, Co-Chairman of the Session and all the authors for their respective efforts in making the session lively.



View of Audience



Vote of thanks being presented by Shri H.P.Gupta,
Hony.Secretary,IBC

At the end of the function, Shri H.P.Gupta, Honorary Secretary, IBC proposed the vote of thanks. He thanked the Chief Guest, for gracing the occasion inspite of his busy schedule. He thanked Shri O.P.Goel founder President, IBC for his blessings who has been torch bearer and source of inspiration to everyone associated with IBC. He expressed his gratitude to the past office bearers of IBC, delegates, technical committee chairman and all members, authors and viewers who had joined physically as well as virtually from all over the country to make the programme success. He profusely thanked the President, IBC for taking utmost pains in making arrangements to hold the function in newly constructed Seminar hall of IBC Head Qtr. building. He thanked Shri M.C.Bansal for the hard work done by him in bringing out the Preliminary Publication and preparing the recommendations of the Seminar. He also thanked the Secretariat staff for the hard work put in by them for making all arrangement in a befitting manner.

In a democracy, the well-being, individuality and happiness of every citizen is important for the overall prosperity, peace, and happiness of the nation.

A.P.J. Abdul Kalam

Independence Day Celebrated in IBC (HQ)



Independence Day was celebrated in IBC by hoisting the National Flag by Shri Pradeep Mittal, President, IBC in the presence of Shri H.P. Gupta, Honorary Secretary, Shri V.R. Bansal, Executive Committee Member, IBC & Former Chief Engineer, North DMC and secretariat staff of IBC.



Webinar on “Role of Professionals in New Education Policy”

Indian Buildings Congress with the support of its Kota, Rajasthan Chapter, organized a webinar on “Role of Professionals in New Education Policy” on 07th May, 2021 at 5:00PM. Shri Pradeep Mittal, President, IBC in his introductory speech welcomed Shri O.P.Goel Founder President, IBC; Prof. B.P.Suneja, Dean (FOEA), Rajasthan Tech University Kota; Prof. Dinesh Kumar, Hon’ble Vice Chancellor, J.C. Bose University of Sc. and Technology, Faridabad; Prof. Raj Nehru, Hon’ble Vice Chancellor, Skill University, Gurugram; Dr. Markandey Ahuja, Hon’ble Vice Chancellor, Gurugram University; Prof. M.P.Punia, Hon’ble Vice Chairman, AICTE; Shri H.P.Gupta, Honorary Secretary, IBC; All viewers and audiences who joined the webinar. He underlined the necessity and importance of the role of professional in New Education policy towards creation of Greener, sustainable, affordable and energy efficient Built Environment. The President also, briefed about the vision and role of IBC in promotion of Built environment.

While referring to the large scale growth of population of our country which is posing threats like unemployment, scarcity of housing & water scarcity, more energy requirement, increasing amount of emission of greenhouse gases and environmental pollution etc. he mentioned that the situation is going to become more serious in near future. Our existing education policy/ system which is completely devoid of imparting moral values, developing pride in our culture, tradition, religion ethics and heritage, has failed miserably to tackle the overall developmental issues including sociological problems.

He mentioned that in implementing the new National education Policy, huge pool of trained professionals will be needed to put the things in right place. IBC can also extend its platform for training of professionals and fresh engineering graduates in its member construction industries. By treating sustainable green design as an art, not just a science, we can elevate economic, aesthetic, community, and ecological values to serve future generations with the help of new National Education policy.

Shri O.P.Goel, Founder President, IBC; in his address, narrated the journey of IBC and its diverse professional activities in dissemination of knowledge in the field of built environment through technical reports, journals, bi-monthly magazines, seminars and conferences. He also

explained the importance of the role of professionals in the 'New Education Policy' to meet the aspirations of masses.

Prof. B.P.Suneja, Dean (FOEA), Rajasthan Tech. University, Kota, gave a detailed presentation on the topic. By linking with the problems being faced by general masses he discussed individual provisions of the new education policy with a targeted goal of achievement for brighter future of country.

The new education policy seeks to restructure school curriculum and Shiksha shastra in a new '5+3+3+4' design, so that school education can be made relevant to the needs and interests of learners at different developmental stages – a 'Foundational Stage' (five years), a 'Preparatory Stage' (three years), a 'Middle Stage' (three years) and the 'High Stage' (four years, covering grades 9, 10, 11 and 12).

It aims to achieve 'universal foundational literacy and basic numerical skills in primary schools by 2025. For this, the Ministry of Human Resource Development shall set up a 'National Mission on Foundational Literacy and Numeracy'. Public and private schools –except the schools that are managed, aided or controlled, by the central government – will be assessed and accredited on the same criteria, benchmarks, and processes. The policy says that all 'higher education institutions' (HEI) shall aim to be multidisciplinary by 2040. By 2030, there shall be at least one multidisciplinary HEI in or near every district.

Prof. Dinesh Kumar, Hon'ble Vice Chancellor, J.C. Bose University of Science and Technology, Faridabad, in his address, lauded the provisions of new education policy and said that if implemented as envisaged, it will help the country in exploiting its potential in research & development for benefit of the common people. He further informed that in the new policy the Higher Educational Institutes shall have the flexibility to offer Master's programmes of two years for those who have completed a three-year undergraduate programme, of one year for students who have completed a four-year undergraduate programme, or five-year integrated Bachelor's and Master's programmes. There is a huge pool of young manpower which if properly trained in a professional manner can help in solving many issues of local sustainability. The new policy envisage the changes from the grass root level. The professionals have a bigger role in implementing the new policy in its right perspective.

Prof. Raj Nehru, Hon'ble Vice Chancellor, Skill

University, Gurugram, in his address while appreciating the New Education policy, expressed that, the policy will help the youth of this country to acquire skills and hands on training suitable for the industry. This will not only help in providing required skilled manpower to the industry but will also generate more avenues of employment. He further stated that for implementing the new National Education Policy, huge pool of trained professionals will be needed. The Government will have to set up many new institutes, recruit large number of professionals in this direction, for achieving around development of the country.

Dr. Markandey Ahuja, Hon'ble Vice Chancellor, Gurugram University in his address, mentioned that over the past few decades, the necessity of new National Education was being felt. After series of meetings and deliberations at length the new National education policy was announced in 2020 by the Government of India, the provisions of which if implemented properly and effectively will solve many issues like literacy, health services, employment and overall development of each sector. He also informed that the policy provides for encouragement of 'high performing' Indian universities to set up campuses in other countries. Similarly, selected universities – such as those from among the top 100 universities in the world shall be encouraged to operate in India. In this way the Indian literature, culture and values will spread across the Globe in its true sense. All these activities will require huge force of trained professionals.

Prof. M.P.Punia, Hon'ble Vice Chairman, AICTE in his closing address informed that the universal participation in schools shall be achieved by tracking students and their learning levels, to ensure they are enrolled and attending school, and have suitable opportunities to re-join or catch up at school in case they have dropped out or fallen behind.

The medium of expression until at least grade five – but preferably till grade eight or beyond – shall be the student's mother tongue, or the local or regional language. The policy seeks to standardise the school curriculum for Indian Sign Language across the country. The policy suggests establishing 'school complexes' consisting of a secondary school and other schools offering lower grades of education – including anganwadi centres – in a radius of 5 to 10 kilometres. Such a complex will have "greater resource efficiency and more effective functioning, coordination, leadership, governance, and management of schools in a cluster."

All education institutions shall be held to similar standards of audit and disclosure as a 'not-for-profit' entity, says this policy. If the institution generates a surplus, it shall be reinvested in the educational sector. As the new policy envisage the changes from the grass root level, the professionals from different fields have a bigger role in implementing the new policy.

At the end of the Webinar, Shri H.P.Gupta, Honorary Secretary, IBC presented the Vote of thanks. He thanked all the panellist for their valuable deliberations and the viewers for joining the seminar and making it successful.

Activities of State/Local Centres

Surat Local IBC Centre

A Week Long Workshop on Practice to Research & Research to Practice in Construction Technology and Management

The workshop commenced on August 2, 2021 with the inauguration ceremony by the workshop coordinator and Secretary of IBC Chapter Surat, Dr. Dilip A. Patel with the brief introduction about the Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat and a brief overview of the entire workshop. This workshop was part of the Diamond Jubilee Celebration of the SVNIT. He emphasized on the major themes of the workshop namely, Building Services, Construction and Demolition Waste Management, Construction Safety Management, Real Estate Management, Transportation Infrastructure Management and Digital Technologies in Heritage Conservation and Management. The workshop was planned with an aim to bridge the gap between the academicians and the practitioners and to make aware the participants especially the students about the rising trends in the field of Construction Technology and Development.

The theme of 1st day workshop was Building Services wherein the major focus was on the Plumbing Systems which is the most neglected component of the Building Services Systems. The lectures planned for the day covered all aspects from saving water to the loopholes in plumbing with steps to overcome them. The first lecture was titled "Save Water" by Mr. Nimishbhai Mehta (Engineer and Practitioner). Next lecture by Mr. Dipak Daiya (Deepak Plumber & Partners, D'Plumbing Consultant, Mumbai) on the topic "Do's

and Dont's in Plumbing" and the final lecture for the day by Mr. Rajeshbhai Dhabuwala (Chairman of Indian Plumbing Association (IPA) Surat Chapter) on "Innovative Products in Drainage". The discussion continued with the possibility of incorporating plumbing system in Academics by floating it as an elective. The speakers also offered to set up a Plumbing Laboratory in the Institute premises, with full-fledged working model of different systems of plumbing for the students to get an actual visual demonstration of the same and also promoting research work in the field of plumbing by post graduate and doctoral students of the institute. The Chairman of IPA Surat Chapter, Mr. Rajeshbhai also offered to start a student's chapter in the Institute with loads of activities and sessions can be conducted as part of it. Integration of BIM and plumbing was also discussed.

The workshop continued for its 2nd day on the theme "Construction and Demolition Waste Management". The topic covered on 2nd day were "Construction & Demolition Waste Management Policy for Gujarat", "Modern Demolition Methods and "Turning Construction and Demolition Waste into National Resources.

The theme of the 3rd day workshop was "Real Estate Management". The topic covered on 3rd day were "Fire Prevention - Life Safety in Real Estate and Real Life", "Future of Quality Control in Construction: A Digital Way" and "3rd Generation Construction Technology - 3D Modular Construction"

The theme of the 4th day workshop was "Transportation Infrastructure Management". The topic covered on 4th day were "Cable Stayed Bridge: Design, Construction and Challenges", "Executing Mega Projects in Urban Environment" and "Delhi-Vadodara-Mumbai Expressway Overview".

The theme for the final day of the workshop was "Construction Safety Management". The topic covered on last day of workshop were "Legal Aspects in Construction Safety", "Safety on a Mega Linear



Construction Project” and “Digitization in Construction Safety and Health”.

Dr. D. A. Patel discussed with the speakers to explore various issues, challenges and problems faced on site with respect to safety and convert them into research topics for the students to work on it and the same can be implemented on site. The speakers were keen to collaborate with the Institute in ongoing research related to safety.

All the sessions were very informative and the participation from the audience made it very interactive.

Chhattisgarh State Centre –Raipur

इंडियन बिल्डिंग्स कॉंग्रेस छत्तीसगढ़ राज्य, केन्द्र-रायपुर वर्षा 2021-22 हेतु नई कार्यकारिणी समिति

इंडियन बिल्डिंग्स कॉंग्रेस छत्तीसगढ़ राज्य केन्द्र रायपुर द्वारा 25/07/2021 को आयोजित वार्षिक सामान्य सभा तथा चुनाव में निम्न कार्यकारिणी समिति का गठन किया गया: श्री शैलेन्द्र शर्मा, अध्यक्ष; श्री सुशील चंद्र सक्सेना, उपाध्यक्ष; श्री रविन्द्र जटारिया, उपाध्यक्ष; श्री राजेश बी. ठाकरे, सचिव; श्री गोवर्धन भट्ट, सह सचिव; श्री दीपक शिर्के, कोषाध्यक्ष। कार्यकारिणी सदस्य: श्री कृष्ण कुमार वर्मा, श्री एस.के.अग्रवाल, श्री आलोक महावर, श्री हेम प्रकाश नायक, श्री नवीन शर्मा, श्री दीपक सनोदिया, श्री सुबोध टोले, श्री अमित केडिया, श्रीमती पुष्पा सुरेन्द्र जैन, श्री अशोक कुमार सिंह, श्री राजन शर्मा।

इंडियन बिल्डिंग्स कॉंग्रेस छत्तीसगढ़ राज्य केन्द्र रायपुर के कार्यालय भवन का स्वामित्वग्रहण

31 जुलाई 2021 को आई.बी.सी., रायपुर के अध्यक्ष श्री के.के. वर्मा द्वारा एलुमानि एसोसियेशन के प्रभारी श्री प्रकाश मिश्रा को पूरी राशि का भुगतान बैंक द्वारा सौपने के उपरान्त एन.आई.टी., रायपुर के गोल्डन टावर स्थित भवन में इंडियन बिल्डिंग्स कॉंग्रेस छत्तीसगढ़ राज्य केन्द्र के कार्यालय भवन की चाबी एवं स्वामित्व एलुमानि एसोसियेशन के अध्यक्ष श्री के.डी. दीवान द्वारा 01/02/2021 को आई.बी.सी. को सौपा गया।

वृक्षारोपण कार्यक्रम दिनांक 5/6/2021

विश्व पर्यावरण दिवस 5/6/2021 के अवसर पर ग्रीन आर्मी आफ रायपुर एवं इंडियन बिल्डिंग्स कॉंग्रेस छत्तीसगढ़ राज्य केन्द्र के सहयोग से रायपुर के रवतपुरा तालाब में पीपल एवं बरगद के 10 पौधों का वृक्षारोपण किया गया।

IBC Congratulates



Shri Mukul Goel an IPS officer of 1987 Batch from Uttar Pradesh cadre on his promotion as DGP of Uttar Pradesh. Born on 22nd February 1964, Shri Goel hails from Muzaffarnagar in UP. During his tenure in the Police Department, Goel has served in various capacities including Police Chief of Almora, Jalaun, Mainpuri, Hathras, Azamgarh, Gorakhpur, Varanasi, Saharanpur and Meerut. He also worked in prestigious positions in Railways, CBCID. Shri Goel is alumni of the IIT Delhi. He was awarded President Police Medal for distinguished services in 2012.

Being Honest
May Not Get You
A Lot of Friends
But
It'll Always Get
You The Right Ones.

National News

PM Dedicates Redeveloped Gandhinagar Capital Railway Station to the Nation



Indian Railways has made a giant leap in the Station Redevelopment Program as Gandhinagar Capital Railway Station is set to offer modern services to the Nation. Prime Minister Shri Narendra Modi virtually inaugurated the newly redeveloped Gandhinagar Capital Railway Station on 16th July, 2021. This project was taken up in partnership with the Gujarat state government and the Ministry of Railways through Indian Railway Stations Development Corporation (IRSDC).

Redevelopment of the Gandhinagar Capital Railway station will act as a booster and create an investment cycle, job opportunities and in general uplift the economy of Gandhinagar, which is the capital of Gujarat.

This is the first of its kind project in India and will pave the way for similar development in land stressed cities like Mumbai, New Delhi and Bangalore. As a part of this mission, work on the redevelopment of 125 stations is in progress out of which Gandhinagar Railway station is one. Out of this IRSDC is working on 63 stations and Rail Land Development Authority (RLDA) is working on 60 stations with two stations being taken up by zonal railways.

The station is future ready, and the concourse will be used for departing passengers when the footfalls increase at the station. However, in the near future, it is planned to open retail, food and entertainment outlets in this area to serve the demands of the passengers



as well as the local population,” an official statement said. “Market players such as Big Bazaar and Shopper’s Stop have also shown interest in opening their mini outlets making it convenient for the passengers and local population to shop at the station. The redeveloped station will function like a ‘City Centre Rail Mall’ where travel will be one of the several function that it will serve.

The station has been developed at par with airports for enhanced customer satisfaction. It has segregated entry and exit through landscape area. Taken upon Engineering Procurement and Construction (EPC) model, Gandhinagar Railway Station is the Indian Railway’s first station to have adopted this model for redevelopment. A unique column-free sleek and economical space frame of 99-meter (105 m curvilinear) span over the platforms (longest such span in Indian Railways comprising of 120 kg/Sqm, steel only) with weatherproof seamless aluminium sheeting is provided at the redeveloped station. Providing sub ways, large foundations to support the tall building and launching the through roof trusses were unique engineering challenges that were addressed successfully during the execution of the work.

The station offers an accessible environment for the divyangjan and has lifts and ramps. Other facilities like tactile flooring are also provided. The station is equipped with modern facilities like spacious entrance lobby with low height ticket booking facility, three

platforms (extendable to five in future) two escalators, ample waiting spaces, through the columnless roof to provide protection against sun/rain etc, air-conditioned multipurpose waiting hall, a baby feeding room, waiting hall at platform for a capacity of 480 passengers, two subways connecting the platforms, improved signages and modern toilets, interfaith common prayer room for the common man.

Other amenities like adequate parking, the art gallery, theme facade lighting, etc will provide additional attractions which will not only enhance passenger satisfaction but will also prove to be a matter of pride for all as this station can boast of many firsts in the country. The old platforms that were 525 metres long have now been extended to 650 metres as per



the existing train length. Without the concourse, the redeveloped station has been designed to handle 1500 passengers in peak hour. With the concourse, the capacity will go upto 2200 passengers in the peak hour.

Daily changeable theme-based lighting with 32 themes is one of the key highlights of the Gandhinagar station which is the first ever on Indian Railways. The concept behind the themed lighting as planned for Gandhinagar Railway Station is to use the redeveloped station as a big canvas. The LED Lights are designed to change the hues every day to add " colour to concrete" and bring life to the building after sunset. The dancing lights shall be used to make the place a destination for the common man.

An exclusive 5-Star Hotel Building "Leela Gandhinagar one of the tallest building in Gandhinagar having 76.99 meter Height with three Towers of

9-11-11 floors arranged in "Triquetra shape" symbolizing "Trinity form has been constructed over the running railway tracks. Vibration and Acoustics studies were got done through reputed international consultant to ensure the passengers in concourse and guests in hotel do not experience discomfort during passage of trains. Elevated Bridge of 937 m length with segregated entry and exit has been constructed to reach the hotel at 22 m height from ground level. The hotel has been built to host national and international guests who would come to attend seminars and conferences at the Mahatma Mandir, a convention centre just opposite the railway station.

Hotel column layout does not match with column layout on platforms. All Hotel Columns were terminated at Deck Level and complete load of the Hotel Superstructure above Deck Level passes through Transfer Girders embedded with ISMB section girders in three layers inside the beam due to excessive shear loading.

Mix Structural Design having Reinforced Cement Concrete (RCC) and Pre-Engineered Building (PEB) structure has been adopted. 1,56,000 Cum. of Concrete, 21,000 MT of Reinforcement Steel and 5,500 MT of Structural Steel has been used in the construction to construct total built-up area of 75,201 sq.m. comprising station area of 26,754 sq.m. and hotel area of 48,447 sq.m.

Intelligent Building Management System (IBMS) controlled MEPF system has been installed at 'Hotel' and 'Station' to regulate all Electrical / HVAC systems and record essential data for evaluation of performance for Green Rating.

The station aims to conserve the natural built environment, through the use of sustainable material like Portland Pozzolona cement, fly ash bricks etc., and reducing the water, electricity requirements through energy efficient designs, rainwater harvesting and recycling of water.

The Complete Building is designed and provided with Green Building Rating features and already obtained CERTIFIED GEM 5 Sustainability Standards Green Certification from ASSOCHAM and is Aspiring for USGBC Green Building Certification with Platinum Rating.

Atal Tunnel an Engineering Marvel in Rohtang

The Atal Tunnel is the longest highway tunnel in the world built at an altitude of 3000 meters and has strategic significance. The tunnel connects Solang Valley near Manali to Sissu in Lahaul and Spiti district. Prime Minister Shri Narendra Modi had inaugurated the Atal Tunnel in Himachal Pradesh's Rohtang on 3rd October, 2020.



Atal Tunnel, Rohtang

The feasibility study for the Atal Tunnel was first done in 1990. The foundation stone for the access road to the south portal of the tunnel was laid on May 6, 2002. The first blast took place in 2010 and the last blast in 2017. The tunnel was constructed using drill and blast NATM (New Austria Tunnelling Method) techniques.

The 9.02 km long tunnel connects Manali to Lahaul-Spiti valley throughout the year. Earlier the road remained impacted for about six months every year owing to snowfall. It reduces the road distance by 46 km between Manali and Leh and the time by about four to five hours. The tunnel is built with ultra-modern specifications in the Pir Panjal range of Himalayas at an altitude of 3000 metres (10,000 feet) from the Mean Sea Level (MSL).

The South Portal (SP) of Atal Tunnel is located at a distance of 25 km from Manali at an altitude of 3,060 metres, while the North Portal (NP) of the tunnel is located near village Teling, Sissu, in Lahaul Valley at an altitude of 3,071 Metres.

It is horseshoe-shaped, single tube double lane tunnel with a roadway of 8 metres. It has an overhead clearance of 5.525 metres. Also, it is 10.5-metre wide and has a 3.6 x 2.25 metres fire-proof emergency egress

tunnel built into the main tunnel itself. There are 18 egress tunnels where after every 500 metres there is an opening in case of emergency for rescue of people trapped inside.

Atal Tunnel has been designed for traffic density of 3000 cars per day and 1,500 trucks per day with max speed of 80 km/hr. It has the state of the art electromechanical system including semi transverse ventilation system.

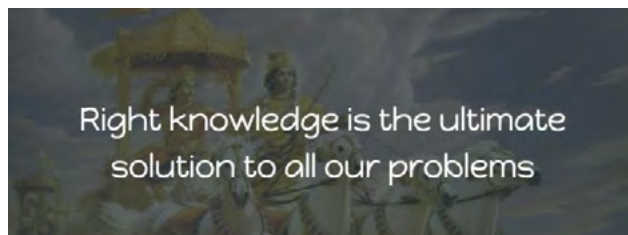
The tunnel has ample safety features built into it including telephone connections at every 150 metres for emergency communication, fire hydrant mechanisms at every 60 Metres, auto incident detection system with CCTV cameras at every 250 metres, air quality monitoring at every one Km, evacuation lighting/exit signs and broadcasting system throughout the tunnel among others.

The Border Roads Organisation (BRO) worked relentlessly to overcome major geological, terrain and weather challenges that included the most difficult stretch of the 587-metre Seri Nalah Fault Zone. The breakthrough from both ends was achieved on October 15, 2017.

In the construction around 15,000 tonnes of steel has been used. It took nearly a decade and cost around Rs 3,200 crore to complete the tunnel.

Atal tunnel will give new strength to India's border infrastructure. It is an example of world-class border connectivity and will be a issue of research for professionals in the field. Connectivity has a direct connection with development. Connectivity in border areas is directly related to security issues.

This border connectivity projects will also aid the security forces in ensuring regular supplies to them and also in their patrolling. While it will be a boon to the residents of the Lahaul and Spiti Valley who remain cut off from the rest of the country in winters for nearly six months due to heavy snowfall, the tunnel will provide almost all-weather connectivity to the troops stationed in Ladakh.

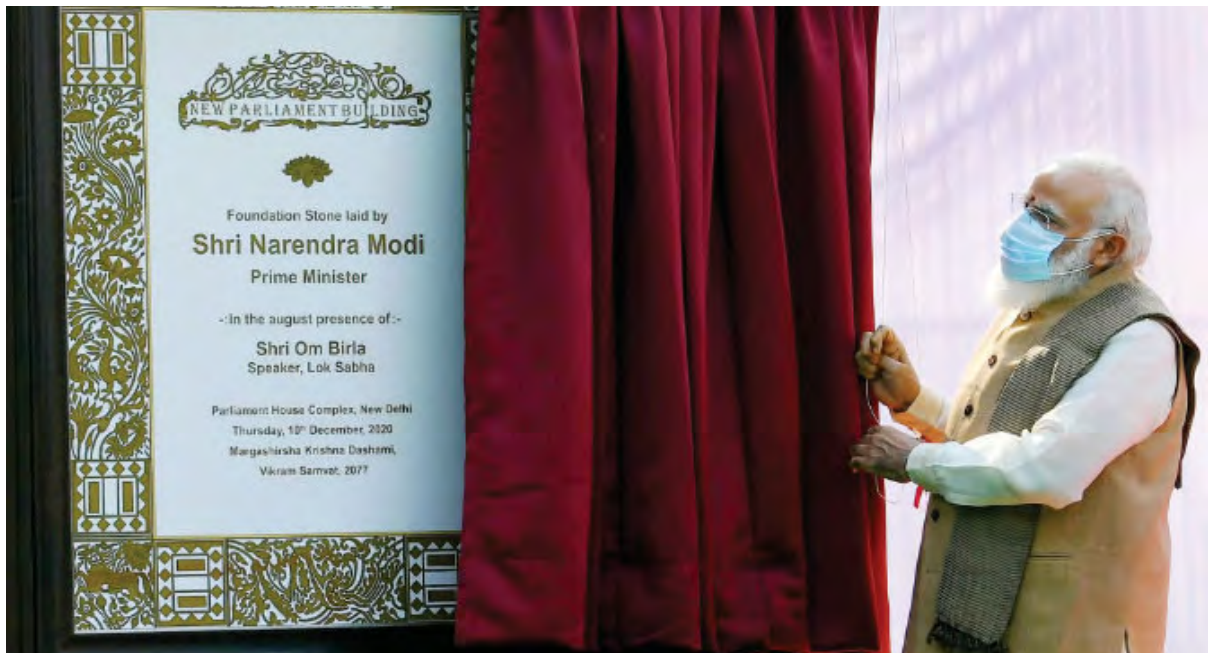


New Parliament Building to come up in 2022

While laying the foundation stone of New Parliament Building on 10th December, 2020 the Hon'ble Prime Minister of India Shri Narendra Modi Ji had said democracy has always been a



Lok Sabha Speaker Shri Om Birla had said the existing Parliament House required restructuring in order to enable the members to discharge constitutional duties but pointed out that it was a heritage structure. He said the members had time



medium to resolve differences. Pointedly citing the techniques of Guru Nanak, he had said 'Jab Tak Sansar Rahe, Tab Tak Sambad Chalte Rehna Chahiye'.

Terming the occasion a milestone, the PM had said the laws made inside the existing Parliament and the debates there are a part of the country's democratic heritage, but it was important to accept the reality that "now it needs rest". New Parliament building would exemplify 'co-existence of the new and the old'.

and again expressed desire for a modern and hi-tech Parliament building for the largest functioning democracy in the world.

The New Parliament Building will have a life of more than 150 years with more than 150% increase in seating capacity. While the interior of the new Lok Sabha will have the theme of peacock, the national bird, Rajya Sabha will have national flower lotus as its theme.

Besides the two Houses, the triangular building will have a Constitution Hall that will exhibit an

original Constitution and a digital form for people to read page-by-page. Constitution Hall at the Centre will have three entry points and will have same height as that of existing Parliament. The rest of the complex will have four floors. Each floor will have offices of ministers and committee rooms. The first floor will have dining space for member of Parliament, VVIPs and visitors. It will also have a central lounge.

Triangles are considered sacred in various religions and cultures in India. Besides being earthquake proof, the new building will be eco-friendly and consume significantly less power. The project will be completed in time in 2022 and the winter session will be held here. This will meet future requirements. The four national symbols will find a place in the building.

The National Emblem will be the crown of the building. In the courtyard, there will be a peepal (banyan), which is our national tree. The building will have state-of-the-art facilities and a souvenir shop for visitors to buy mementos related to the Parliament.

The building will have the most modern security and surveillance system. The security check will be mostly non-intrusive. Dholpur and red stone from Rajasthan will be largely used, as is the case with the existing Parliament. In some of the interior portions, red granite may be used in place of red sandstone.

Provisions will be made in the furniture inside the Houses for smart displays and biometrics for ease of voting for members. The digital audio visual system, which will be placed in front of every seat, will have programmable rules-based microphones, which will put the Speaker in control of who gets to speak and who does not.

Every Member of Parliament, Minister and Political party will get office space in the New Parliament Building and in the lawmaker's enclave, which will come up on the plot where Transport Bhavan and Shram Shakti Bhavan are currently located. These buildings will be connected to the Parliament complex with a tunnel and will have enough parking space.

World's Largest Renewable Energy Park to Come Up in Kutch

The future for an environmentally friendly world lies in renewable energy. And what better way to work on this than build an energy park? Well, India will soon get the world's largest renewable energy park in Kutch, Gujarat.

This park with 30,000-megawatt capacity will be constructed along the Indo-Pak border at Khavda in Kutch, Gujarat. Spanning 72,600 hectares of wasteland, this hybrid renewable energy park will use both wind and solar energy. Hon'ble PM Shri Narendra Modi while laying the foundation stone for the world's largest renewable energy park on December 16, 2020, had said this first kind of project will play a significant role in fulfilling India's mission. The goal is to generate 450 GW (4,50,000 MW) of power by 2030.

This park will be bigger than India's biggest metro cities. It will produce power using the energy of the Sun and the wind. The mega project will assist in better usage of a vast piece of land in the



desert. Moreover; it shall also secure the land border. The world's largest energy park has a lot in store for people.

Apart from taking India closer to its 450 gw of renewable energy goal by 2030, it will also have two zones. The first zone shall use sunlight and wind to produce electricity. The second zone will be wind power-based. According to News18 reports, the government chose Kutch for this project as building a solar park near the border will act as a boundary.

School made of Sandstones in the Middle of Thar Desert Needs no ACs

An architectural marvel, located just a six-minute drive away from Jaisalmer's (Rajasthan) famous Sand Dunes, has taken shape in Kanoi village, with an aim to educate girls and empower them. The Rajkumari Ratnavati Girls' School in Thar desert, where day temperatures peak close to 50 degrees Celsius and harsh winds cause sand to blow through the day, is made of yellow sandstone, and surprisingly, has no air conditioners. Here, students can study and even play in the protected courtyard without worrying about the extreme weather.

It took a decade for Michael Daube, founder of CITTA, a non-profit organisation, to conceptualise the building, and help it materialise. Michael roped in New York-based Architect Diana Kellogg, who conceived the design. The actual construction started in October 2018 and it took nearly a year to complete.

CITTA (Cities as International and Transnational Actors in the European Science) Foundation is a registered non-profit organisation in India. The organization CITTA was first initiated in 1998 in the USA to support communities in some of the poorest and most remote areas of the world that lack access to proper healthcare and education and face significant obstacles to economic development. Now, through local leadership and commitment, the CITTA Foundation, India has come up with its first project, the 'GYAAN Center for Women' in Jaisalmer, Rajasthan on 22 acres of land donated by Jaisalmer Foundation President Manvendra Singh.



The school is visually impressive, with an oval-shaped structure that blends in the desert landscape. The building also comes with elements of sustainability. The school portion, known as the Gyaan Centre, will accommodate 400 girls from kindergarten to Class X. The complex also has a textile museum and performance hall, as well as an exhibition space for artisans to sell their crafts. In another building, women will be trained in traditional arts like weaving and textiles to preserve dying handicrafts.

"The oval shape works, as it symbolises womanhood across many cultures. The symbol projects infinity and complements the landscape of dunes that merges with the school. It is also how the children play in circles or the women work in a community. The close circles of a community, like the extended aunts, uncles and relatives, are unique to Indian culture," Diana tells 'The Better India', adding that the curves blend well with the forms of the forts that are round in Jaisalmer.



The elliptical shape of the structure also helps bring aspects of sustainability. "The canopy and the jalis filter the sand. They keep the sun and heat out. The pattern of airflow inside the building naturally cools it down," she says.

Diana says that using local material to create the infrastructure helped reduce carbon emissions. "There are talented artisans in every village surrounding the school, and there could not be better material to use than sandstone," she says, adding that this helped reduce the carbon footprint from transportation and logistics.

The courtyard in the complex can harvest 3.5 lakh litre of water and store it in its belly. The inner walls of the building are plastered with lime, which insulates the building. The local sandstone has been used for construction, which provides protection from extreme heat during the day, and warmth during evening hours.

The solar panels on top of the building work as a canopy, and provide shade while simultaneously powering the building. A cooling system uses geothermal energy at night to cool the building during the day.

Not only will the Centre provide economic development, education, and skills training for girls and women residing in the Jaisalmer District, it will also provide a unique outlet to enhance gender parity in the region. Thus, the school will help bring together culture, growth opportunities for women, and tourism, all of which will create a "ripple in the desert".

Reliance Industries plans to set up 100GW (Gigawatt) Solar Energy capacity in the country by 2030

Reliance Industries Ltd. Chairman, Shri Mukesh Ambani, in its 44th Annual general meeting held on 24th June, 2021 announced that the company will spend Rs 75,000 crore, or over \$10 billion, on adding giga-size clean energy knowledge and manufacturing verticals to its diversified business empire over the next three years.

The company will "target to achieve costs that are lowest in the world to ensure affordability of locally manufactured solar modules" and "enable at least 100 GW (gigawatt) of solar energy capacity by 2030, Chairman Mukesh Ambani told shareholders.

"As one of the biggest energy markets in the world, India will play a leading role in transforming the global energy landscape. The company is launching new energy business with the aim of bridging the green energy divide in India and globally," he said.

RIL's solar plan takes on the combined might of companies such as Adani Solar, Vikram Solar, Waaree Energies and Tata Solar. It is more than six times bigger than the current domestic module manufacturing capacity of 15 GW and 14 times larger than 7 GW operational capacity that meets 35% of domestic demand.

The renewables complex will be set up on 5,000 acres of land and will be amongst the largest such integrated facilities in the world. It will house four giga

LOOKING BEYOND OIL

RIL plans to delink its fortunes from oil prices

| | | |
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| Its solar plan is enough to match combined capacity of Adani Solar, Vikram Solar, Waaree Energies and Tata Solar | The plan is over six times bigger than the current domestic module manufacturing capacity of 15GW | It is 14 times larger than 7GW operational capacity that meets 35% of domestic demand |
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“The company will “target to achieve costs that are lowest in the world to ensure affordability of our solar modules” and “enable at least 100GW (gigawatt) of solar energy capacity by 2030

—MUKESH AMBANI | CHAIRMAN, RIL

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factories' for producing solar photovoltaic (PV) modules from scratch, advanced batteries for solar storage projects, electrolyser plant for green hydrogen and fuel cells for hydrogen vehicles.

These facilities envisage an investment of Rs 60,000 crore. An additional Rs 15,000 crore will be invested into creating utilities, ancillary units and partnerships for creating a new energy eco-system. Two verticals will be set up for providing end-to-end renewable project management solution and financing.

RIL appears to be targeting the gap in India's solar manufacturing capability, while it chases a target of 175 GW by 2022 based on imported equipment. The timing of the plan coincides with the government's Rs 4,500 crore production linked incentive to encourage domestic manufacturing.

The green hydrogen and fuel cell units will prepare the conglomerate for a market for new-age mobility solutions such as hydrogen vehicles lurking on the horizon, as envisaged in the budget 2021 national hydrogen mission.

750 MW REWA Solar Project a First Plant to Supply Solar Power to an Institutional Customer

Solar energy would power aspirational India in the 21st century and the country is emerging as the "most attractive market for clean energy" because of the "exemplary progress" made in this field. Dedicating the Asia's largest solar power project of 750 MW Rewa project in Madhya Pradesh to the Nation on July 10, 2020 the PM had described solar energy as "Sure, Pure and Secure". Such large-scale solar projects are a representation of 'Atmanirbhar Bharat (self-reliant India)'.



The project promoted by a joint venture between the state government and SECI, the central agency implementing the national solar mission, is being described as the first solar plant to supply power to an institutional customer — Delhi Metro Rail Corporation — outside the state. The DMRC will get 24% of the energy and 76% will go to the M.P.State Electricity distribution companies. Rewa Solar Power Plant is expected to reduce the emission equivalent to around 15 lakh tonnes of CO₂ annually.

The India's solar policy and strategy reflected the government's thinking of "keeping our environment, air, water pure". All government programmes give priority to environmental protection and ease of living. India has resolved the economy versus ecology dilemma by focussing on solar energy and other environment-friendly measures. The PM had said, economy and ecology are not contradictory but complementary to each other.

MP would soon become India's main centre of solar energy with similar large projects in progress in Neemuch, Shajapur, Chattarpur and Omkareshwar. The state's poor, middle-class, tribals and farmers would be the biggest beneficiaries. The power plant is spread in an area of 1500 hectares of land.

IIT Delhi finds way for cleaner, greener and cheaper Hydro Fuel

A steep rise in global energy demand in the 21st century, combined with the necessity to curb greenhouse gas emissions, have driven researchers to look for cleaner and greener energy sources as alternatives.

An IIT Delhi research group under the supervision of Prof. Sreedevi Upadhyayula, Prof. Ashok N. Bhaskarwar and Prof. Anupam Shukla from the Department of Chemical Engineering and Prof. Saswata Bhattacharya, Department of Physics have taken up the research for clean fuel production at low cost. The other researchers in the team include Shri Shailesh Pathak, Shri Kishore Kondamudi (Department of Chemical Engineering) and Ms. Shikha Saini, Department of Physics.

In the study, researchers from IIT Delhi in collaboration with the ONGC Energy Centre, India have successfully split water by a process known as Sulphur-Iodine (SI) thermo-chemical hydrogen cycle to generate low-cost, clean hydrogen fuel for industrial consumption. Hydrogen gas, a viable choice as a renewable substitute for fossil fuels, can help mitigate emissions.

Prof. Sreedevi Upadhyayula, said, "There is an imminent need to switch over to renewable energy sources such as water. The thermo-chemical hydrogen cycle for splitting water offers a practical means of generating hydrogen as a fuel and also oxygen as a by-

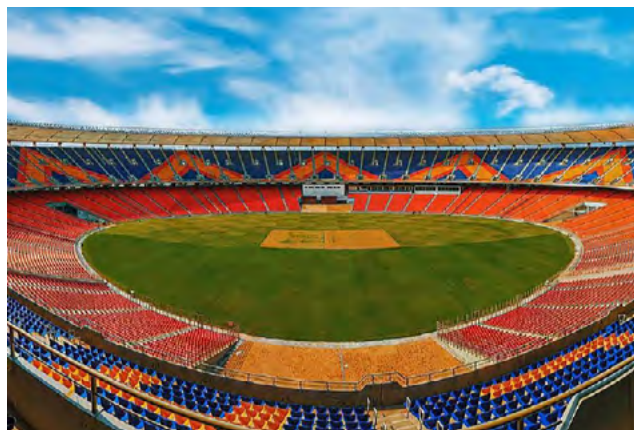
product. Hence, it can be considered favorably for the commercial production of hydrogen on a large scale, in the near future.”

One of the challenges in the low-cost conversion taken-up by the IIT Delhi researchers in this work, was to design a suitable catalyst for the energy intensive, corrosive step of sulphuric acid conversion to sulphur dioxide and oxygen. The in-house catalyst developed by them meets these criteria and is now patented, and a process based on these is developed and demonstrated here in the Institute. The modified iron oxide catalyst dispersed on silica surface on a silicon-carbide support catalyst is not only cost-effective and is also functional under the high temperature and corrosive conditions of the reaction. Other catalysts and membranes used in the pilot plant have also been developed in-house.

Narendra Modi Stadium- The Largest Cricket Stadium in the World

The Narendra Modi Stadium, previously known as the Motera Stadium, is a cricket stadium situated inside the Sardar Patel Sports Enclave in Ahmedabad, Gujarat, India. As of 2020, it is the largest cricket stadium in the world and the second largest stadium overall, with a seating capacity of 110,000 spectators. It is owned by the Gujarat Cricket Association and is a venue for Test, ODI and T-20 cricket matches.

On 24th February, 2021, the stadium was renamed as the Narendra Modi Stadium. It hosted its first ever pink ball Test match on 24th February, 2021 between India and England.



The redesigned stadium occupies 63 acres of land, with three entry points compared to one in the old stadium, with a metro line at one of the entry points. It contains 76 corporate boxes that can hold 25 persons

each, a 55-room clubhouse, an Olympic sized swimming pool and four dressing rooms. A unique feature of the stadium is the LED lights on the roof instead of the usual floodlights at cricket grounds. The LED lights are installed on an anti-bacterial, fire proof canopy with PTFE membrane that covers 30 out of 55 metres width of sitting area. The roof was done by the company Walter P Moore and was specifically designed to be lightweight and separate from the seating bowls in order to make it fairly earthquake resistant. The structure eliminates the need for pillars and gives spectators an unobstructed view of the entire field from any place in the Stadium.

Outside of the main ground, the stadium is able to accommodate several other features, including an Olympic-sized swimming pool, an indoor cricket academy, badminton and tennis courts, a squash arena, a table tennis area, a 3D projector theater, and a clubhouse with three practice grounds and 50 rooms. The parking lot can accommodate 3,000 cars and 10,000 two-wheelers. Sardar Patel Stadium also has a huge ramp designed to facilitate the movement of around 60,000 people simultaneously. The stadium has been designed such that patrons fill the lower levels of the ground for smaller events to maintain the crowd atmosphere when not at capacity.

It has also been planned that the stadium will be connected to the metro station by a skywalk to decrease road congestion.

The total area of the stadium is equivalent to 32 olympic-size football fields put together. It is currently the only cricket stadium in the world to have four dressing rooms for the players, which makes it possible to play back to back games in the same day. It is also the only stadium in the world with 11 centre pitches on the main ground. Day-Night test match was played in this stadium on 24th February, 2021 between India V/s England.

DDA's Sanjay Lake View Complex Project to come up under Transit-Oriented Development Policy

Delhi Development Authority has put its ambitious Sanjay Lake View Complex project, which was on the backburner for the past few years, on the fast track. The project will have highrise apartments with uninterrupted view of the huge water body in east

Delhi, apart from commercial units like hotels and lakefront plazas, promenades and skywalks.

The complex near Trilokpuri is one of the Transit Oriented Development (TOD) projects planned by DDA along with NBCC. It will come up adjacent to Trilokpuri-Sanjay Lake Metro Station of Pink Line on land measuring 10.3 hectares (25.3 acres).

50% of the project area falls under 300- meter radius of the Trilokpuri-Sanjay Lake Metro Station of Pink line (Majlis Park- Shiv Vihar). 45% land is marked for mixed residential and commercial use. 20% land is marked for green areas and recreational purposes. 20% land is marked for public roads and circulation area. 15% land is allotted for police post, fire station etc.

Project will have more residential than commercial component. Project will also have hostels, old age apartments, service apartments, dormitories etc. Lake view hotels are also planned. Lake front development will include lake facing plaza, skywalks, promenades, boating, eateries & jogging track.

Sporting facilities, two service markets, post office, two nursing homes and electric sub-station are the main amenities which will be provided. Besides this Fire station and Petrol-filling station are existing on site.

The change in land use from commercial to residential has been approved in a meeting of DDA chaired by L.G. The project shall be developed for mixed use based on TOD norms. It envisions a transformatory role for the area and will enhance the local economy. It will help catalyse change and, eventually, restore a sense of safety and social pride in adjoining Trilokpuri and Kalyanpuri.

The project planned in 2015 included twin corporate towers, green area, studio apartments, old-age homes and hotels. However, the residential area was found to be more viable in the long run. The mixed commercial and residential development will ensure that the area remains active throughout the day, making it safer for women, all thanks to “eyes on the lake”.

This would be the second TOD project to be undertaken by DDA with NBCC after the Karkardooma project, which is bigger in scale and preliminary work on which has started. The TOD policy for Delhi was notified by Centre on December 24, 2019 as part

of Master Plan of Delhi 2021. The policy envisages sustainability features for development of hubs such as zero waste discharge, 100% treatment and maximum reuse of waste water, segregation and reuse of 100% green waste, at least 10% of the energy demand should be met through renewable sources like solar, etc.

DDA said people would be able to enjoy the view and amenities at the lake, such as boating, jogging, playing, etc. It believes the attractions would increase footfall, making the area more active round the clock. It added the project would not affect the Sanjay lake catchment area in any way as no permanent constructions would be undertaken in the green area and only fully permeable and organic materials would be used.

The “Ice Stupas” that could solve Water Problem of the Himalaya

Climate change in the Indian region of Ladakh has shrunk glaciers and made rainfall and temperatures unpredictable. Water is needed to irrigate the fields of barley, apples, and other crops in spring, but the glacial melt doesn't arrive until summer. To spare farmers a barren yield, engineer Sonam Wangchuk has invented a way to bring the glaciers to the people.

In 2015, with \$125,000 raised on a crowd funding site, Wangchuk built a 64-foot-tall “Ice Stupa”— an artificial glacier made by piping mountain streams into a Ladakhi village. The water spouts geyser-like from a vertical pipe, freezing into a cone of ice shaped like a Buddhist shrine. It's designed to stay frozen until the spring sun warms the fields.



Sure enough, Wangchuk's prototype began to melt in April, watering a field of newly planted popular trees. By June, when the regular glacial melt began to flow, the ice stupa was mostly gone.

Now Wangchuk is laying a pipeline to build 50 more ice stupas. Each will supply 10 million liters of water a year and irrigate 25 acres of land. Ice Stupas are being used to grow crops in the harsh desert.

Word of his project has reached mountaintops across the world. He has built Europe's first ice stupa, in the Swiss Alps, and he is now working on refreezing a glacial lake in India to halt flash floods.

Wangchuk hopes that if locals adapt now, their descendants won't become climate refugees. "We in the mountains are minorities, not just ethnically but climate wise," he says. "Things that work in plains do not work in the mountains. We have to find our own solutions for our problems."

Puri becomes India's First city to drink water straight from the Tap.

Puri joins the league of international cities like London, New York and Singapore as its 2.5 lakh population now has access to Drink-from-Tap quality water round the clock. This transformative initiative will also benefit the 2 crore annual tourist to India's spiritual capital. The project will further prevent the usage of 3 crore plastic bottles which in turn will help eliminate 400 metric tonnes of plastic waste, thereby reducing environmental pollution. Starting with Puri, the Drink-from-Tap Mission, under the Odisha government's 5T governance mantra, is soon set to cover 16 towns with a 40 lakh population. 5T means team work, technology, transparency, transformation and time limit which will be the five factors on which performance of government officials and projects will be judged by Odisha Government. Adherence to 5T charter is now the top priority of the Odisha government.

IIM-C may become Bengal's First 'Net-Zero' Campus with New-Age Tech

The Indian Institute of Management Calcutta (IIM-C) is set to become the first 'net-zero campus' in Bengal with 'net zero energy', 'net zero discharge' and 'net zero waste'. The campus is also going for a massive expansion drive where a new academic block and a

hostel to house approximately 1,000 students will be added.

CPWD, which is executing the project, has asked architect Hafeez Contractor to prepare the campus master plan and design the new academic block and hostel. A comprehensive exercise was initiated to develop a phased plan to upgrade the residential and academic infrastructure on the Joka campus to international standards with the involvement of numerous stakeholders.

Explaining the concept of 'net-zero campus', Shri Prabhakar Singh, member of the BoG, IIM-C, said a campus is described as 'net-zero' when the building becomes highly energy efficient and fully powered by on-site renewable energy sources. "At Joka, we not only want to be net-zero, but net-positive. By this, we mean to produce more energy than we consume. We have a 135-acre campus and huge resources of water from lakes. We are keen on solar energy plants. Additionally, the lakes can be used as heat sink and help as cooling towers for air-conditioning plants, thereby reducing air-conditioning heat output. By using variable refrigerant flow (VRF) air-conditioners, we can not only reduce our energy consumption but also save 30% of it," he said.

Shri Singh added the institute will be using advanced yet simple water-saving technology without any heavy cost. The campus will become a net-positive water campus and reduce its requirement from water supply agencies. The water generated will be used in washrooms, air-conditioning and horticulture, among others. The focus will be on a sewage treatment plant at Joka. The manure obtained from it, will allow the institute to produce fuel and electricity, not just on campus but also to help the neighbouring community with energy resources. The campus will have green buildings, as well as smart buildings, where technology will make the experience better.

मोहाली (मुल्लांपुर) अंतर्राष्ट्रीय क्रिकेट स्टेडियम हुआ दुनिया का सबसे हाईटेक स्टेडियम

मोहाली (मुल्लांपुर) अंतर्राष्ट्रीय क्रिकेट स्टेडियम जिसका नया नामकरण महाराजा यादविन्द्र सिंह स्टेडियम हो गया है, को ग्रीन बिल्डिंग कांसेप्ट के तहत तैयार किया जा रहा है। 150 करोड़ रुपये की लागत से आठ लाख स्क्वायर फीट में बना यह स्टेडियम मोहाली के आई.एस. बिंद्रा स्टेडियम से तीन गुना बड़ा है। दुनिया के बाकी हाईटेक स्टेडियमों के



मुकाबले ये थोड़ा अलग है और विषम परिस्थितियों में भी यहां मैच आयोजित किए जा सकते हैं।

भविष्य की जरूरतों के हिसाब से बनाया जा रहा यह क्रिकेट स्टेडियम दुनिया का सबसे हाईटेक क्रिकेट स्टेडियम है। इसमें बिजली की आपूर्ति सोलर सिस्टम से पूरी होगी। रेन वाटर हार्वेस्टिंग से पानी की आपूर्ति की जाएगी। इसके अलावा इस्तेमाल किए गए पानी को भी दोबारा इस्तेमाल किया जाएगा। हरियाली के लिए खासतौर पर पेड़ लगाए गए हैं। स्टेडियम में स्पेशल ड्रेनेज सिस्टम लगाया गया है। जितनी भी बारिश हो, मैच बाधित नहीं होगा। बारिश बंद होते ही पिच आधे घंटे में खेलने के लिए तैयार होगी। दर्शक धूप व बारिश से बचे रहेंगे, इसके लिए दर्शक दीर्घा में पारदर्शी छत लगाई जा रही हैं।

इस अंतर्राष्ट्रीय स्टेडियम में सुविधाओं का भी पूरा ध्यान रखा गया है। इसमें 30 कॉरपोरेट बॉक्स हैं, जोकि अभी तक भारत के किसी भी स्टेडियम में नहीं हैं। हर कॉरपोरेट बॉक्स में 60 सीटें होंगी। बड़े-बड़े कॉरपोरेट घराने अपने लिए इन्हें 10 से 20 साल तक बुक करवा सकते हैं। दर्शक क्षमता को देखा जाए तो इसमें कुल 36 हजार लोग एक साथ बैठकर मैच का लुत्फ उठा सकते हैं।

अंतर्राष्ट्रीय पिच क्यारेटर श्री दलजीत सिंह बताते हैं कि यह देश का ऐसा इकलौता क्रिकेट स्टेडियम है जिसमें सात अंतर्राष्ट्रीय स्तर की पिच तैयार की गई है। हर पिच पर अंतर्राष्ट्रीय स्तर के मैच हो सकते हैं। भविष्य में तमाम आइपीएल और अंतर्राष्ट्रीय मैच इसी स्टेडियम में होंगे क्योंकि इसमें पार्किंग और ट्रैफिक संबंधी कोई दिक्कत नहीं होगी। यहां एक साथ 1640 गाड़ियों को पार्क किया जा सकता है।

सौर ऊर्जा चलित ए.सी.

एयर कंडीशनर यानी ए.सी.को चलाने का खर्च काफी ज्यादा होता है। ऐसे में लोग इसे खरीद तो लेते हैं लेकिन जरूरत भर चला नहीं पाते हैं। लोगों को इसी परेशानी को देखते हुए कंपनियों ने अब सोलर ए.सी.बाजार में उतार दिए हैं।

गर्मियों में औसतन 15 से 16 घंटे तक लोगों के घरों में ए.सी. चलता है। अगर इसे 1 टन का भी मान लिया जाए तो औसतन इतना ए.सी.को चलाने पर रोज 20 यूनिट तक का खर्च आ जाता है। अगर महीने के हिसाब से देखें तो यह करीब 600 यूनिट बिजली होती है। राज्यों के हिसाब से औसतन करीब 6 रुपये से 7 रुपये यूनिट तक इसका दाम है। इस प्रकार राज्यों के हिसाब से 1 टन का ए.सी.एक महीने में करीब 3600 रुपये से लेकर 4200 रुपये तक की बिजली खर्च कर देता है। साल में करीब 8 महीने गर्मियों के ही होते हैं ऐसे में



सालाना बिजली का बिल औसतन 28800 रुपये से लेकर 33600 रुपये तक हो जाता है। इसमें अगर ए.सी. की कीमत औसतन कीमत 40000 रुपये जोड़ दी जाए तो पहले साल ए.सी.करीब 68800 रुपये से लेकर 73600 रुपये का पड़ता है।

1 टन सोलर ए.सी. औसतन 1 लाख रूपए का पड़ता है। यह बिजली के ए.सी.से करीब ढाई से तीन गुना महंगा है लेकिन इसके फीचर इसे सस्ता बना देते हैं। यहां पर आपको सोलर ए.सी.खरीदने के लिए एक बार में 1 लाख रुपये खर्च करना पड़ेगा लेकिन अगर देखा जाए तो यह बिजली से चलने वाले ए.सी. के 2 साल के खर्च के बराबर है। वहीं सोलर ए.सी. खरीदने पर आपको राज्य के हिसाब



से कुछ सब्सिडी भी मिल सकती है। एम.एन.आर.ई.यह सब्सिडी सोलर एयरकंडीशनर को सब्सिडी उपलब्ध कराती हैं। लेकिन सोलर ए.सी. लेने से पहले चेक कर लें क्योंकि हर सोलर ए.सी. पर यह सब्सिडी नहीं मिलती है।

सोलर ए.सी.लेने में जरूर महंगा है लेकिन इसका मेंटेनेंस खर्च बिजली के ए.सी.की तुलना में काफी कम है। बाजार में ढेर सारी कंपनियां सोलर ए.सी.उपलब्ध करा रही हैं।

इस सोलर ए.सी.के साथ कंपनियां सोलर पैनल प्लेट और डीसी से ए.सी. कंवर्टर भी उपलब्ध कराती हैं। इन सोलर पैनल प्लेट को घर में खुली जगह पर लगाया जाता है। इस जगह पर धूप अच्छी तरह से आनी चाहिए। जितना अच्छी धूप मिलेगी बिजली उतनी ही ज्यादा बनेगी। इसके अलावा साथ में मिलने वाली डीसी बैटरी इस सोलर प्लेट से चार्ज होगी जिसके जरिए बिजली मिलेगी। इसकी मदद से आपका सोलर ए.सी. चलने लगेगा और बिना अतिरिक्त खर्च के ठंडी हवा देगा। आजकल हाइब्रिड सोलर ए.सी. भी आ गए हैं। इन ए.सी. को 5 स्टार रेटिंग मिली हुई है। यह ए.सी. बिजली से चलने वाले ए.सी. की तरह ही काम करते हैं लेकिन इन्हें 3 तरीकों से चलाया जा सकता है। पहला विकल्प है सोलर पॉवर दूसरा बैटरी बैक अप और तीसरा सीधे बिजली से। जहां 1 टन के स्पलिट सोलर ए.सी. 1 लाख रुपये तक में आ जाता है वहीं 1.5 टन के सोलर ए.सी. करीब 1.39 लाख रुपये तक में आता है। इसमें सोलर पैनल सोलर इन्वर्टर और अन्य सामान की कीमत शामिल होती है।

आर्टिफिशियल इंटेलीजेंस से दृष्टि दिव्यांग भी देख सकेंगे दुनिया

रोज छड़ी लेकर गुजरने वाला दृष्टि दिव्यांग अगर किसी दिन बिना सहारे के आकर आपके सामने खड़ा हो जाए और आपको पहचानकर हाथ मिलाने के लिए हाथ आगे बढ़ा दे तो चौंकने की जरूरत नहीं है। डॉ. ए.पी. जे. अब्दुल कलाम प्राविधिक विश्वविद्यालय के विज्ञानियों ने आर्टिफिशियल इंटेलीजेंस पर आधारित ऐसा आविष्कार कर दिखाया है, जिसकी मदद से अब दृष्टि दिव्यांग भी दुनिया देख और महसूस कर सकेंगे।

विश्वविद्यालय के विज्ञानियों ने एक ऐसा कैमरा युक्त डिवाइस तैयार किया है, जिसके जरिए दृष्टि दिव्यांग अपने आसपास की चीजों को आभासी रूप से देख सकेंगे। इसके लिए दैनिक जीवन में जिन वस्तुओं का सामना करना पड़ता है उनकी गुणवत्तापरक छवि को जुटाया गया है। डीप लर्निंग मॉडल के तहत ऐसी बहुत सारी छवि (इमेज) के साथ अलग-अलग परिस्थितियों में निर्णय लेने के लिए इसे तैयार किया गया। इस उपकरण में लगा कैमरा सामने की वस्तु को देखकर ध्वनि निर्देशों के रूप में दृष्टिबाधित व्यक्ति को बताता है। इतना ही नहीं यह वस्तुओं के वर्गों के साथ उनकी संख्या की गिनती भी कर लेता है।

यह डिवाइस आर्टिफिशियल इंटेलीजेंस और सेंसर बेस्ड है। ऐसे में इसके इस्तेमाल के लिए इंटरनेट की आवश्यकता भी नहीं है। यह पोर्टेबल और हल्के वजन का है और इसे तीन अलग-अलग मोड पर काम करने के लिए डिजाइन किया गया है। इंडोर (भवन के अंदर काम करने के लिए), आउटडोर (सड़क, पार्क आदि यानी बाहर के लिए), टेवस्ट रीडर मोड (रेस्तरां में मेनू कार्ड, अखबार और साइन बोर्ड आदि पढ़ने के लिए) डिवाइस के सामने हाथ को स्वाइप

करके विभिन्न मोड को चुना जा सकता है। सामने किसी भी तरह की बाधा आने पर यह ऑडियो मैसेज के जरिये सूचना देता है, ताकि उपयोगकर्ता उस बाधा के बारे में जानकर सुरक्षित रूप से हटा सके।

‘एन्ट्रोपी’ नाम की अंतरराष्ट्रीय शोध पत्रिका में प्रकाशित शोध में इस दृष्टि दिव्यांगों के लिए चीजों के देखने और समझने में सबसे कारगर बताया है। प्रो. एम.के. दत्ता, राकेश जोशी और सौम्या यादव के साथ इस शोध में स्पेन के आर्टिफिशियल इंटेलीजेंस विशेषज्ञ प्रो. कार्लोस एम-ट्रैविसो गोंजालेज सह-शोधकर्ता हैं।

भारत को अंतरिक्ष में नई उड़ान देगा बीएचयू का ‘सूपर फ्यूल स्टोरेज’

बीएचयू (बनारस हिंदू वि.वि.) के एमिरेट्स प्रोफेसर व पदमश्री से सम्मानित प्रो. ओ.एन. श्रीवास्तव और युवा विज्ञानी अनंत प्रकाश पांडेय ने इसरो के लिए दुनिया का सबसे क्षमतावान कार्बन एरोजेल हाइड्रोजन स्टोरेज विकसित कर दिखाया है। सरल भाषा में कहें तो सबसे उन्नत फ्यूल टैंक। किंतु टैंक को शकल में नहीं, वरन कार्बन एरोजेल के रूप में, जो रॉकेट में इस्तेमाल होने वाले ईंधन (तरल हाइड्रोजन) को सोख कर स्टोर करेगा। इस तकनीक से अंतरिक्ष मिशन में लंबी दूरी के रॉकेट की गति और शक्ति में कई गुना वृद्धि होगी। दावा है कि इसरो के मंगल और मानव मिशन में यह तकनीक अहम भूमिका निभाएगी।

प्रोफेसर ओ.एन. श्रीवास्तव और विज्ञानी अनंत प्रकाश पांडेय ने अपने इस अनुसंधान की जानकारी देते हुए बताया कि भारतीय अंतरिक्ष अनुसंधान संगठन (इसरो) से हुए करार के तहत इस प्रोजेक्ट पर काम किया गया व दुनिया का सबसे क्षमतावान कार्बन एरोजेल हाइड्रोजन स्टोरेज बनाने में सफलता पाई।

प्रो. श्रीवास्तव ने कहा, यह ट्राई इथाइल एमीन द्वारा तैयार एक कैटालाइज मैटेरियल है। अब इसका उपयोग पहली बार लंबी दूरी के रॉकेट (जियो सिंक्रोनस लांच व्हीकल) के क्रायोजेनिक इंजन में हो सकेगा। वह बताते हैं कि क्रायोजेनिक इंजन के ईंधन भंडारण में अब तक धातु के टैंक का उपयोग होता आया है, जिसमें हाइड्रोजन को तरल अवस्था में रखा जाता है। इससे रॉकेट का भार बढ़ने के साथ ईंधन भी कम स्टोर हो पाता है। वहीं, क्रायोजेनिक इंजन में तरल हाइड्रोजन के वाष्पोत्सर्जन की समस्या भी आती है, जबकि कार्बन एरोजेल से निर्मित स्टोर तरल हाइड्रोजन को सोख लेता है और आवश्यकतानुरूप इसे ईंधन के रूप में उत्सर्जित करता रहता है।

बीएचयू में देश का एकमात्र हाइड्रोजन सेंटर है, जो इस तरह के रा.ट्रीय-अंतरराष्ट्रीय महत्व के शोध पर काम करता है। वहीं, श्री अनंत प्रकाश पांडेय कहते हैं, इस स्टोरेज की

क्षमता अंतरराष्ट्रीय स्तर से एक कदम आगे की है। दुनिया में पहली बार ट्राई इथाइल एमीन की मदद से सामान्य तापमान पर सुखाए गए कार्बन एरोजेल से ही इस हाइड्रोजन स्टोरेज का बना लिया गया है, जो कि बेहद किफायती और प्रभावी है।

कार्बन एरोजेल को दुनिया का सबसे हल्का पदार्थ भी कहा जाता है। दिखने में फोम जैसा होता है।

जहां मर्ज, वहीं मार करेगा नैनो कैप्सूल

जहां मर्ज, वहीं मार। जितनी जरूरत, दवा की उतनी ही डिलीवरी। न दूसरे ऊतक व अंगों को नुकसान और न ही असंतुलित डोज। यह संभव होगा, नैनो पार्टिकल कैप्सूल से, जिसे आइ.आइ.टी. कानपुर के प्रोफेसर डा. प्रणव जोशी और यहां से पोस्ट डॉक्टरेट कर रहीं रिसर्च स्कॉलर डा. अर्चना रायचूर ने बनाया है। कार्सिनोमा, टीबी और अल्जाइमर जैसे रोगों में कैप्सूल के प्रयोग का परीक्षण सफल रहा है। अब इसे बाजार में उतारने की तैयारी है। इस नैनो कैप्सूल को यूएस सेफटी फूड एंड ड्रग एडमिनिस्ट्रेशन ने मान्यता भी दे दी है।

अभी तक कैंसर में कीमोथेरेपी और टीबी और अल्जाइमर में दवा की सीधी डोज दी जाती है। इनके अपने साइड इफेक्ट हैं। कीमो का असर कैंसर से प्रभावित ऊतक के साथ शरीर के अन्य हिस्से पर होता है। टीबी और अल्जाइमर के इलाज में भी यही दिक्कत है। दवाओं की अधिक मात्रा से शरीर की प्रतिरोधक क्षमता कम होने के साथ अन्य दुष् प्रभाव सामने आते थे। ऐसे में दवा केवल प्रभावित ऊतक तक ही पहुंचे, इसके लिए दो साल शोध करने के बाद डॉ. अर्चना रायचूर ने ड्रग डिलीवरी सिस्टम तैयार किया। उनके साथ मैकेनिकल इंजीनियरिंग के प्रोफेसर डॉ. प्रणव जोशी ने कैप्सूल की डिजाइन, वकिंग और मैटीरियल पर शोध किया। यह नैनो पार्टिकल कैप्सूल दवाओं को मर्ज वाले स्थान तक ले जाएगा। मर्ज के स्थान पर पहुंचने तक दवाओं का प्रभाव बना रहेगा। शरीर के अन्य मालीक्यूल या एंजाइम से प्रभावित नहीं होगा।

यह कैप्सूल ऐसे बायो पॉलीमर से बना है, जो बच्चे-बुजुर्ग, सभी के लिए सुरक्षित है। शरीर के किसी भी हिस्से को नुकसान नहीं पहुंचाएगा। तथा जरूरत के अनुसार छोटे से छोटा डोज डिलीवर कर सकेगा। इस कैप्सूल से जटिल रोगों का इलाज करना आसान होगा।

**You have the right to work only
but never to its fruits.**

International News

World's First Flying car completes 35-minute Inter cities test flight

Flying cars have been a fantasy for many for decades. A car that is equally capable of running on roads and flying in the sky, sounds interesting but technically challenging. However, in the last couple of years, several companies tried their hands on this technology and came up with innovative prototypes.

One such prototype flying car has completed a test flight between two cities in Slovakia, spending 35 minutes airborne. The test flight took off from Nitra airport and landed at Bratislava international airport. Klein Vision's AirCar flew between Nitra and the capital Bratislava on 28th June, 2021, according



to a CNN Business press release published on 30th June, 2021.

The Air Car Prototype 1 is powered by a 160 horsepower BMW engine, and comes equipped with a fixed propeller. It transforms from aircraft to road vehicle in less than three minutes. It has now completed more than 40 hours of test flights, according to Klein Vision, including flying at 8,200 feet and reaching a maximum cruising speed of 190 kilometres per hour (118 miles per hour).

After landing in Bratislava on 28th June, 2021, the aircraft transformed into a car, and was driven into the city centre by Klein Vision CEO Stefan Klein and company co-founder Anton Zajac. "AirCar is no longer just a proof of concept," Zajac said in the press release. "It has turned science fiction into a reality."

The company is working on a model called AirCar Prototype 2, which will boast a 300 horsepower engine. It is expected to be able to cruise at 300 kilometres per hour (186 miles per hour) and have a range of 1,000 kilometers (621 miles). Klein Vision plans to develop three- and four-seater models of the AirCar, as well as twin-engine and amphibious versions, according to its website.

Flying cars have been in discussion for quite some time. These vehicles are being considered as the future medium of city commuting and inter-city transport as the roads are becoming increasingly congested. Flying cars can help in decongesting roads and reduce travel time as well.

Nasa Lander Reveals Mar's Deep Interiors

The seismometer of Nasa's Insight lander has revealed details about the deep interior of Mars for the first time. Before InSight's touchdown on the Martian surface in 2018, Nasa's study of the Red Planet through the rovers and orbiters was primarily concentrated on its surface. But three research



papers based on InSight's seismometer data have provided much-awaited details on the depth and composition of Mars' crust, mantle, and core.

In the study, the scientists confirmed that Mars' core, which has a radius of 1,830 kilometres, is molten. They will continue using InSight data to determine whether its inner core is solid like the Earth's. The crust was thinner than expected and scientists believe that it may have two or even three sub-layers. The crust could be as deep as 20 kilometres with two sub-layers and 23 kilometres if there are three.

"This study is a once-in-a-lifetime chance," Simon Stähler, lead author of the core paper, stated. "It took scientists hundreds of years to measure Earth's core; after the Apollo missions, it took them 40 years to measure the Moon's core. InSight took just two years to measure Mars' core."

In Sight's seismometer has recorded over 700 marsquakes and many of them between 3.0-4.0 magnitudes, supporting the idea that the location is seismically active. While Mars has no tectonic plates unlike Earth, it does have volcanically active regions that can shake the surface.

"We'd still love to see the big one," said JPL's Mark Panning, co-lead author of the paper on the crust. "We have to do lots of careful processing to pull the things we want from this data. Having a bigger event would make all of this easier."



From Editor-in-Chief Desk

Post Covid – 19 Pandemic – Role of Construction Sector to help boost GDP of India

The sudden outbreak of Covid-19 Pandemic and consequent lockdown resulted in economic downturn in the country. The construction sector is likely to help reviving economy back. Therefore, to start with, annual spending on infrastructure sector is required to be increased by the Government so that it will give boost to construction Industry. The construction industry is labour intensive and second largest employer after agriculture. It contributes to seven percent of India's GDP. It will also promote growth of industries which provide raw materials and machineries for construction industry. Besides, need for advance equipment will also be generated.

Post pandemic, several global investors are likely to shift their industry to India. So India is likely to become major manufacturing hub. The construction sector will in turn develop to construct factory buildings, residential accommodation and infrastructure.

The policy change by Government of India has permitted 100% Foreign Direct Investment for development of townships and cities. Dedicated fund for Affordable Housing under National Housing Bank and identification of hundred Smart cities have huge financial outlay by Government. This will also boost construction sector.

The construction related activities under real estate sector include housing, retail hospitality and commercial development. Besides, demand for office spaces and accommodation will also increase. Construction industry ranks third among major sectors. The present levels of urban infrastructure are quite inadequate to meet demand of urban population.

The growth of construction sector will raise demand for raw materials and in turn it will increase growth of raw materials suppliers and producers.

Thus construction sector and its related sectors are bound to grow in past pandemic period and our country will achieve prosperity for the welfare of our citizens. Those who are involved in construction sector should work for development of this sector. It is matter of satisfaction that I.B.C. has already started organizing conferences related with development of construction sector. It is suggested that members can consider forming technology groups or cooperatives in this field. These groups can take specific task in this sector from Government, contractors and consultants, as per their capability. Thus, they can give technical input for development of this sector and earn some money as well.



(K.B. Rajoria)

Invitation of Entries for “IBC Awards for Excellence in Built Environment 2021”

IBC Award for Excellence in Built Environment – 2021 is invited in eight categories, viz, (i) Residential units & Housing Complexes (ii) Commercial and Office Buildings (iii) Institutional Campuses (iv) Industrial Structures (v) Rehabilitation/Retrofitting of Buildings (vi) Infrastructures Projects (vii) Monumental Structures and (viii) Recreational Schemes. Award consists of a Trophy and Citation. For details, visit IBC website www.ibc.org.

The above Awards will be presented during the Inaugural Function of 25th Annual Convention of IBC. Entries for the Awards complete in all respect should reach IBC Secretariat latest by September 30, 2021.

25th Annual Convention and National Seminar – December 2021 Proposal for Theme Suggestions Invited

25th Annual Convention and National Seminar of Indian Buildings Congress is likely to be held in December, 2021. A Seminar on a topical subject would be held along with the session. Four themes hereinafter already given by few members are “Carbon print of building materials and construction practices over life time and possibilities to reduce the same”; “Development of river front in cities and related issues”; “Effect of Pandemic on built environment”; and “Sustainable Infrastructure Development Goal with Vision-2047”. Members of the Indian Buildings Congress are requested to suggest a suitable theme except the above four themes for the Seminar. An explanatory write up on the proposed theme along with sub-themes may be sent to the Indian Buildings Congress by September 15, 2021.



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Printed and Published by H.P. Gupta, Honorary Secretary, Indian Buildings Congress
Sector-VI, Kama Koti Marg, R.K. Puram, New Delhi-110022, Ph: 011-26169531, 26170197

Email : Info@ibc.org.in; indianbldgscongress@gmail.com; Website: www.ibc.org.in

Printed By: Shree Krishan kirpa Printers; Mob: 9311661244, 9811759739;

Email: shrikrishankirpa63@gmail.com

Price : ₹ 20/-