



Message from the President

Dear Readers,

We have come to the end of this calendar year 2019 and a beginning of the last year of this decade 2010-20. This is the time of the year for celebration and merriment. This is also the time to reflect on the year which has just passed / about to pass. I want to take a moment to express my sincere thanks to all of you who supported our association; our valued readers, who read and write for our newsletters and SED's; our active as well as silent members who have been constantly supporting us in the year 2019. I also take this opportunity to wish you and your family members a very happy and prosperous new year 2020 ahead.

We are very fortunate to be practicing structural engineering at a time of unparalleled change and exciting developments around us. Recent advances in technology, digital workflows and advancements in analytical techniques might appear to pose a threat to many old guards (like me). Many of us may view these developments as a threat to our profession in terms of potentially making the structural engineer more obsolete. I would tend to look at these issues more positively. Though it is a huge challenge, we should be using this as an opportunity to free up our time to engage more meaningfully in the most important aspects of our role in the new environment. Society expects structural engineers to exercise conceptual creativity and imagination; provide leadership in wider project teams with multi-disciplinary approach and Innovate in structural form and material use.

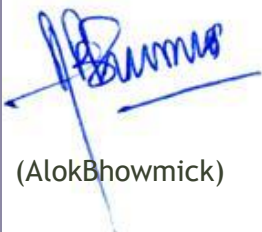
The pace of digital developments in our profession demands solutions with urgency for adaptive action amongst our professional fraternity. Key measures to be taken by all stakeholders in this regard, as I can foresee, with a view to help prepare us for the coming years, shall be :

1. Promotion of open knowledge sharing
2. Improved collaborative working
3. Developing a culture of lifelong learning

As we all are approaching the New Year 2020, May I take this opportunity to request all members of IAStructE to take a new years resolution for the betterment of the profession and share the same with us via email. We will publish some of the select few resolutions by our members in our next newsletter.

Happy Reading and once againHAPPY NEW YEAR 2020 !

With warm regards



(Alok Bhowmick)

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Newsletter Contents

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Call for articles

The Chairman and other members of the SED Editorial Board invite article contributions for the quarterly Journal of the Indian Association of Structural Engineers, the Structural Engineering Digest. Write to iastructe@gmail.com for

Journal subscription | Article Submission | Sponsored Advertisement

Deadline for submission in next issue: 1st February 2020.

Submission template and ethics statement can be availed by emailing iastructe@gmail.com

The Editorial Board also invites the articles for the **April - June 2020 SED issue, which will be dedicated to the Theme “Structural Connection & Detailing”**. Sub themes are i) Concrete Structures; ii) Steel Structures; iii) Hybrid / Composite Structures; & iv) Post Installed Connections. **Interested Professionals may submit the Abstract by 15th January 2020 and full paper by 29th February 2020.**

Obituary: Shri Ajit K. Bhattacharyya

Late Shri Ajit K. Bhattacharyya, an eminent engineer, was born on 08.02.1932. He did his BE(Civil) in 1953 from Bengal Engineering College. He was the Honorary Fellow of IAStructE and Fellow of IStructE UK. He was the member of many professional bodies. He retired from Northern Railway as General Manager in 1990. He received the Silver Elephant Bharat Scouts Guides Award from the President of India. Mr. Ajit K. Bhattacharyya was closely associated with the Indian Association of Structural Engineers and very actively participated in all the programs of the Association.



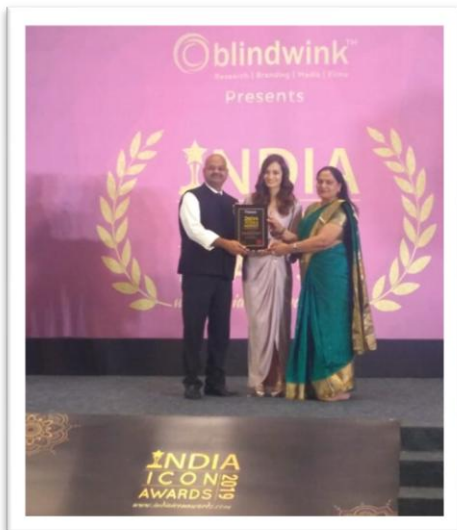
Member Achievements

Wade Asia conferred Ms Sangeeta Wij, GC member IAStructE with “Golden Wade 2019” Award

Wade Asia concluded its 4th Edition on the 11th & 12th October 2019 at NSIC, New Delhi. During which they presented the “Golden Wade 2019” Award to Ms Sangeeta Wij, GC member IAStructE & Managing Partner, S D Engineering Consultants LLP. Ms Sangeeta Wij renowned Structural Engineer with M.Tech from IIT Delhi has exhaustive experience in Structural Analysis, design and drawings for earthquake resistant design of structures. She has worked on a large number of Institutional, Commercial, Industrial & Infrastructure Projects in India and abroad, mainly dealing with Structural and PHE Services design and detailing. She is also associated with the Women in Engineering Committee of WFEO. She also dons the hat of being the President of Women in Science & Engineering (Wise India).



Mr Vineet Lochan Gupta, GC member IAStructE & C.E.O. Save Techno Engineers receives an award for Best Project Management Consultancy & Building Design Services in India



India Business Awards, 2019, conceived and initiated by Blindwink is aimed at eulogizing and facilitating the achievers. The most sought after awards was organized by Blindwink during which Save Techno Engineers under the leadership of Mr Vineet Lochan Gupta, GC member IAStructE received an India Icon 2019 Awards for Best Project Management Consultancy & Building Design Services in India.

IAStructE President, Mr Alok Bhowmick elected as a Fellow, Indian National Academy of Engineering

Recognising his commendable work and invaluable contribution in the field of bridge and structural engineering, the Council of the Indian National Academy of Engineering (INAE) elected Mr Bhowmick as a Fellow of INAE with effect from 1st November 2019.

The Indian National Academy of Engineering (INAE), founded in 1987 comprises India's most distinguished engineers, engineer-scientists and technologists covering the entire spectrum of engineering disciplines. INAE functions as an apex body and promotes the practice of engineering & technology and the related sciences for their application to solving problems of national importance. The Academy also provides a forum for futuristic planning for country's development requiring engineering and technological inputs and brings together specialists from such fields as may be necessary for comprehensive solutions to the needs of the country.



The Academy honours Indian and Foreign nationals who are elected by “peer” committees in recognition of their personal achievements in “Engineering” which are of exceptional merit and demonstrated distinctive eminence in the new and developing fields of technology. The election to the Academy is by invitation only. Presently INAE has 832 Fellows from India and 81 Foreign Fellows on its rolls divided into ten Engineering Sections.

A close look at the Fellowship profile of INAE indicates that less than 22% of the elected Fellows are from industry, while the balance 78% of the fellowship is with Academics and R&D institutions. It is therefore a rare distinction for Mr Bhowmick to represent the industry in this core group of eminent engineers.

Skeleton Consultants Pvt Ltd headed by Er. Dr. Abhay Gupta felicitated by ICI-Ultratech



Skeleton Consultants Pvt Ltd Noida, headed by Er. Dr. Abhay Gupta, GC Member of IAStructE has been felicitated by ICI-Ultratech Rajasthan State center by presenting a certificate of Merit & a plaque for their project "351-feet high Lord Shivastatue at Nathdwara, near Udaipur", adjudged as "OUTSTANDING CONCRETE STRUCTURE" in the Infrastructure & other Category of Construction awards. This statue is likely to be completed by February 2020 and then will be FOURTH tallest in the world. It has a 20000m2 cast-in-situ concrete skin over 2500 MT structural steel framing. Skeleton consultants have provided structural engineering design on this project and the same has been

reviewed by Prof.Prem Krishna. Wind Tunnel testing of this was done at WindTech Sydney Australia. The award was received by Er. Nitesh Agrawal, GM design from Skeleton at Jaipur on 21st December 2019.

Technical Lecture

A Technical Lecture by Dr S. K. Dhawan, GC member IAStructE& Former Chief Engineer CPWD on the topic “Structural Health Monitoring of Existing structures with case study” organized on 26th December 2019 at New Delhi.



Seminar

Revision of structural concrete codes IS: 456 & IS: 1343

A one-day IAStructE seminar on “Revision of Structural Concrete Codes IS 456 & 1343” was organized at Gayatri Vidya Parishad College of Engineering (GVP-CoE), Vishakhapatnam on Friday, 22 November 2019. This seminar was jointly organized by GVP-CoE in association with IIIT Hyderabad and Indian Institute of Bridge Engineers.

Background: Last revision of IS:456, Indian Standard Code of Practice for Plain and Reinforced Concrete, was released around 20 years ago - and brought significant changes to provisions relating to materials (including durability, etc.) but provisions relating to design were virtually not touched and allowed to stand at the level of 1978. Now, significant lessons have been learnt since 1978 through extensive research and experience across the world. A need to collect formal feedback from stakeholders and suggest a re-look at the document has been acutely felt. It may also be noted that changes are needed in the allied codes on RC Structures, and synchronize the provisions.

Program: The seminar had 4 keynote lectures, viz., 1) Provisions for Uni-Axial Bending in IS: 456 by Prof. Dr. Ing. P. S. Rao, 2) New Directions of Unified Concrete Code by Prof. C.V.R Murty, IIT Madras, 3) Major Structural Design Provisions by Prof. Rupen Goswami, IIT Madras and 4) Suggestions for Improvements by Prof. R. Pradeep Kumar, IIIT Hyderabad. Seminar provided a platform to share the experience of stakeholders in terms of gap areas, loopholes, shortcomings, additional items required, revisions or corrections needed, etc., in the current concrete codes of India, though the focus could be the provisions in IS 456-2000.

Over 8- participants who include around 40 consultants, 20 from academia and around 20 students attended the one-day seminar.

Ramancharla Pradeep Kumar
Professor of Civil Engg, IIIT Hyderabad
& Vice President (South)IAStructE





Exhibition: Structural work of Shri Mahendra Raj

The exhibition was held from 17th November 2019 to 25th December 2019 at Kiran Nadar Museum of Art, 145, DLF South Court Mall, Saket, Saket District Centre, New Delhi 110017.

An exhibition was showcasing the structural works of Shri Mahendra Raj like Hall of Nations, Akbar Hotel, Srinagar Stadium, Vidhan Bhawan, Hindon River, Tagore Hall, Sardar Patel Stadium, NCDC Building, and similar structures and their detailed drawings were illustrated.

The museum also showcased videography of Shri Mahendra Raj discussing over the structural aspects, the timeline chart depicting his life fully devoted to the structures.

The main attraction point of the exhibition was his two really special structures Hall of Nations and Akbar Hotel. The Hall of Nations was at its time one of the most interesting and challenging work which was the concrete frame structure. The concept was really innovative and new in concrete design. The museum exhibits its half built model made from straws to really catch the eyes of the visitors coming there. It also exhibits the reinforcement detail of joints formed in Hall of Nations with actual reinforcement bars. The second best showcasing is of the Akbar Hotel where a very new concept of using Transfer girders where introduced to transfer the load of the structure to mother earth.



Significance of Technical Audits of all buildings

I hope we are all aware of the mandatory provisions of Ch-II NBC vis a vis the issue of Technical Audits for all important buildings and all buildings >15 m in height ; it's advised to carry out comprehensive multi-disciplinary audits every 3 to 5 years and ensure that inadequacies are addressed and strengthening carried out before issuing a Fitness Certificate to the Building Owners. In addition, NDMA Guidelines of Hospital Safety mandate an Immediate Occupancy design of all new Hospital Buildings and immediate Retrofit of all existing Hospitals as per their recommended guidelines.

Besides, many of us may not know that BIS 16700 (covering building structures >50m height from foundation level) does not permit the use of Moment Resistant Frame or flat Slabs and Shear Wall systems in Zones IV and V. There are many salient provisions of this Code requiring attention from our industry professionals including design engineers, Clients and Architects.

Besides, Asymmetry and Irregularities in planning of buildings and the implications , in Seismic Zones III, IV and V, are now even more clearly defined in BIS 1893-Part I, and I hope all of us are familiar with them?

However, in my experience, Local Authorities in most cities are neither aware of the above provisions nor equipped to handle such a gigantic task of Technical Audits and conveniently ignore the provisions (Ignorance is Bliss?? Certainly not, it's a curse and will lead to disasters)

USAID and UNDP have recently carried out trainings for Govt Engineers in two cities on Technical Safety Audits and the Best Practices for Earthquake Resistant designs and our firm has been involved to deliver the trainings. I believe this activity may be emulated in more cities and Audits must be diligently implemented with the help of Industry professionals. More awareness must be created amongst all stakeholders to make it a mass movement for enhancing safety in our built habitat.



Ms Sangeeta Wij, GC member, IAStructE
President, WISE India & Managing Partner SD Engineering Consultants LLP

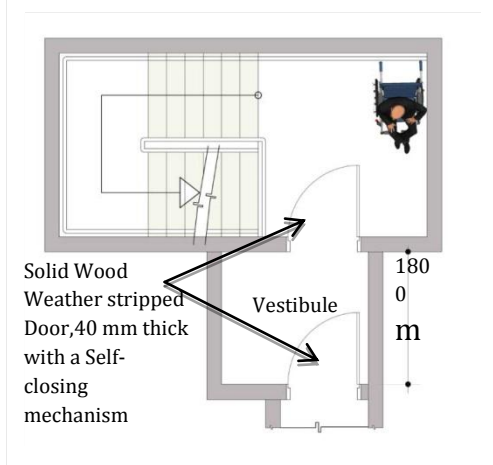
Kolkata's East-West Metro Disaster

The following YouTube link provided by Prof Mainak Ghoshal, Member IAStructE, Ex. Jt. Secretary & Governing Body Member-Coal Ash Institute of India may be found useful to know regarding that the Kolkata Metro Mega Disaster - How did it happen? and What next?

<https://www.youtube.com/watch?v=wFDJZ5GBfG0>

Minimizing Fatalities in a Fire

As one of nature's most destructive forces, accidental fires can be unforgiving. They can erupt in all conditions, at any time, and without notice.



Despite best efforts by regulatory agencies to prevent fires from occurring, fires do take place. In North America, regulations governing the use and storage of flammable materials, fire suppression requirements, and exit routes are well established. However, in India and many other countries in the subcontinent, awareness relating to its establishment and adherence to the proper guidelines that can help minimize loss of life from fire is severely lacking. Much work needs to be done to bring awareness to the best practices to be followed in case of a fire emergency for the safe evacuation of occupants. In India, building fires are mostly accidental. They are usually caused by human error; faulty electrical components, general negligence, and improper maintenance. Deficient fire regulations only add to

the inadequacy of protection against the loss of life and property. Yet another major reason for the cause of building fires in India is the improper storage of combustible materials in habitable buildings. In such cases, presence and close proximity to flammable materials in a habitable building significantly reduces the time available to the occupants for the safe evacuation from the building.

For improving the performance level of an exit-enclosure, a vestibule at each floor level and for each exit enclosure must be provided to help maintain smoke free exits.

Besides non-operational/non-functional or locked emergency exits, some of the other important reasons for high fatalities caused by fires in India, is the absence of adequate active, direct, and effective fire-protection systems. A recent fire in a commercial building in Surat, the State /Province of Gujarat, resulted in the death of at least 18 people. According to publicly available data, in 2015 alone, India suffered 1,800 fire-related deaths-many of them avoidable.

In this report, as registered professional engineers and licensed building code officials working in North America, we recommend a few cost-effective fire-protection measures that can improve the performance level of a building to help minimize fatalities.

In the event of a fire emergency, the most important requirements are to evacuate the occupants to safety, controlling the spread of fire, and extinguishing fire.

Buildings in India are generally constructed of masonry and concrete. Use of such materials provides an indirect (passive) fire protection system for the building. In such cases, wall and floor assemblies resist penetration of fire from one floor to the other, thus delaying the spread of fire.

For complex buildings, active fire-protection systems are essential. Active fire-protection systems include automatic fire detection and fire suppression systems. For extinguishing fire and protecting both the building and neighbouring structures, an effective fire-fighting system is essential. This includes accessible fire access routes, operational fire hydrants, and standpipe systems. Loss of life can be minimized when both active and passive life safety systems are working coherently.

Exits must be located and arranged so that they are clearly visible, separate, remote, and accessible at all times. They must also be easily identifiable and visually non-confusing.

An automatic sprinkler system designed, installed, tested, and maintained as per relevant codes is an active and effective fire-protection and life safety system. Functions performed by this system, independent of the fire department response time include, controlling the extent of fire by distribution of water so as to decrease the heat release rate (buoyancy or resilience), controlling fire growth and fire spread to adjacent buildings, cooling the fire compartment and therefore preventing it from reaching flashover. In addition to providing substantial property protection, a functioning sprinkler system allows additional time to the occupants for safe evacuation.

For the successful operation of an automatic sprinkler system, adequate and reliable water supply in terms of pressure, volume and time is required. Due to limited availability of water in many parts of India, it is difficult to achieve fire-protection, as intended. The available information suggests there are no such provincial or municipal bylaws available in India that can be enforced by the regulators for installing such systems.

To make all of the above-stated fire protection and fire suppression systems work effectively, coordination between local governments, local municipalities, professional designers, owners, and builders is essential.

A major concern that has been ignored in India is the evacuation of occupants requiring assistance, such as persons who use wheelchairs. In North America, it is the fire responders who help to rescue such persons. Because fire responders in India take more time to reach the fire site due to constraints such as non-accessible narrow lanes, streets and overcrowded roads, persons who use wheelchairs as well as those who cannot self-evacuate are at a greater risk of not being rescued.

Therefore, exit routes are to be kept free of obstructions and they are to be functional at all times. Obstructions in the exit route reduce the useable width and also the number of persons that can pass through it, thereby increasing the possibilities of queuing/stampede.

In North America, after receipt of notification of a fire, fire responders will typically deploy a full first alarm assignment at a fire scene within 10 minutes or less. In comparison, there are no national regulations that mandate such a requirement in India. Therefore, an alternative method should be designed to evacuate people who are not capable of self-preservation (ability to evacuate unassisted).

Fires can spread quickly and may become life threatening in minutes. By the time one notices a fire on the floor or hears an alarm, it may be too late to plan an escape. One should not waste time and must evacuate the building immediately.

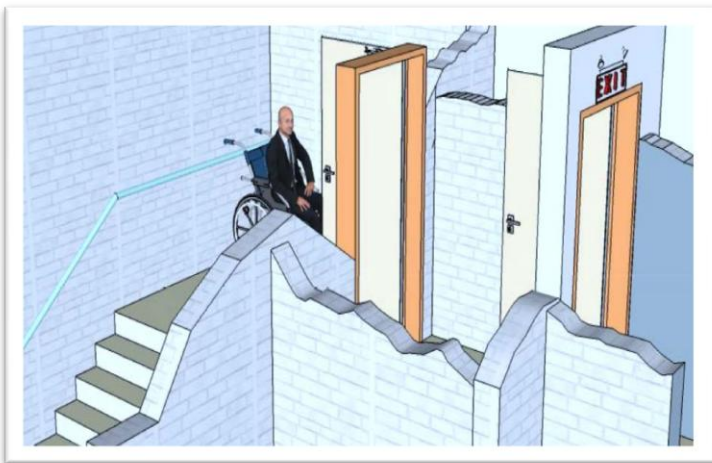
A system that includes detection is one of the significant life safety systems that should be installed in all commercial buildings in India for alerting occupants of a fire emergency. Once the occupants are alerted of a fire emergency, the second most important component for evacuating the buildings are the exits, which are considered as temporary refuge areas that provide access to a safe place (e.g., the exterior of the building). Exits that can accommodate the occupants of the building with required exit-capacity should be available. The distance from the most remote point in the floor area to an exit should be minimized. Time taken to reach an exit generally depends on the

health of the occupants of the building. For example, patients in a hospital or a nursing home would take more time to reach an exit due to the factors relating to occupant's age, health, and mobility. In addition to travel distance and queuing time, time taken to reach an exit is also influenced by the number of people living in a building at any given time (occupant load), number of exits, obstructions in the exit route, width of corridors/aisles, width of egress doors and their exit capacity.

In the absence of reliable and functioning automatic fire-suppression systems and fire department access routes, the possible and feasible fire safety provisions explained below, would help reduce the number of fire related deaths, if followed diligently.

An exit is a path that does not stop at an exterior exit door, but continues to provide access to the city street or a space that is remote from the building. Every floor area that is intended to be used for occupancy is required to be provided with a minimum of two exits to allow the occupants of the building to evacuate safely before fire makes the environment untenable. A minimum of two exits is required to ensure that the occupants are still able to evacuate if one of the exits becomes inaccessible due to smoke or fire.

For the safety of occupants, exits are to be separate (independent), fire separated from the remainder of the building, and remote from every other exit. A minimum distance of 9 m between the two exits would qualify these to be remote exits.



In addition, exits are to be located and arranged so that they are clearly visible or that their locations are clearly indicated. All exits are to be accessible at all times. They must also be clearly (easily) identifiable and visually non-confusing. The intent of the above-listed requirements is to limit delays in evacuation or movement of occupants to a safe place in case of an emergency. Adherence to the above requirements also helps emergency responders reach the exits and carry out their emergency operations effectively and without delay.

Smoke build up in the exit route could also lead to delays or ineffectiveness in fire emergency response operations. During fire, heat and smoke rise, and staying closer to the ground and crawling can help evacuate the building safely. Therefore, exit routes are to be kept free of obstructions and they are to be functional at all times. Obstructions in the exit route reduce the useable width and also the number of persons that can pass through it, thereby increasing the possibilities of queuing/stampede. For meeting the requirements of a functional exit door, it must open in the direction of exit travel and swing on its vertical axis. Exit doors that serve an exit stair are to be provided with self-closing mechanisms and should never be secured in an open position. In addition, exit doors should be provided with weather stripping or smoke seal that helps prevent the passage of smoke from the adjoining areas into the exit enclosure. The above measures will ensure that the exit enclosure, which is used as a temporary refuge is not contaminated or compromised during a fire emergency.

The integrity of exit enclosures must be maintained at all times, requiring all penetrations to be fire stopped to seal the openings. For improving the performance level of an exit-enclosure, a vestibule at each floor level must be provided to help maintain smoke free exit-enclosure.

Every exit door is to have an exit sign placed over or adjacent to it. Every exit sign is to be visible on approach to the exit, located and arranged so that it is clearly visible or its location is clearly indicated. Exit signs should be in conformance with ISO 3684-1 and ISO 7010. If no exit is visible from a corridor used by the occupants, an exit sign with an arrow or pointer indicating the direction of egress is to be provided.

An exit-enclosure and an exit route must be equipped with emergency lighting to provide illumination to an average level of at least 10 lx during all conditions including loss of regular power. Each building must be provided with emergency power supply to maintain emergency lighting/power from a power source such as a generator or batteries or a combination thereof that will continue to supply power automatically for a period of not less than one hour in the event regular power supply to the building is interrupted.

Increasing the performance level of fire and life safety in a building to a level that would be acceptable in North America would require significant capital expenditure. Keeping this in mind, short term measures have been recommended with the goal of eventually upgrading the building practices in India.

The life safety and evacuation of occupants from a building in case of a fire emergency is a complex subject and it is not possible to compress all of the aspects related to them in one article. If the above-suggested options are followed as short-term measures, it would be reasonable to conclude that the number of fatalities would likely be reduced. Based on our experience as skilled fire protection professionals, the above cost-effective alternative measures are the best options as of now. For new building, perhaps, more onerous measures could be incorporated into the design and construction of buildings.

For questions, please contact Avinash Gupta at avinashguptap.eng@gmail.com



The authors, Avinash Gupta and Dominic Esposito, are practicing professional fire protection engineers. They are currently working in North America for the building code industry. Both have made presentations on matters related to building code all across Canada. In addition, they have written several articles for professional magazines. Avinash Gupta is currently State/Territory head for building and fire codes and is one of the 13 members of the Provincial-Territorial Policy Advisory Committee on Codes (PTPACC).

Disclaimer: In North America, engineering is a self-disciplined and self-regulated profession ensuring that designs conform to generally recognized norms and practices. The authors have modified the information from the general practices of North America, without compromising the performance level, to suit the prevailing conditions in India. The above views are for educating the local municipalities, local leaders, owners, residents, trades, students, educators, and professionals.

Sustainable Materials & Green Buildings- A Review

Global population and consumption are increasing very fast. According to "World Resource Institute", in the last 15 years, production wastes are increasing in spite of the increasing knowledge. According to "The Living Planet" report, humanity is now consuming over 20% of resources than the earth can produce.

The ecological footprint has emerged as the world's premier measure of humanity's demand on nature. This accounting system tracks on the demand side, how much land and water area a human population uses to provide all it takes from nature. This includes the area for producing the resource it consumes the space for accommodation, roads and other infrastructure and the ecosystem for absorbing its waste emissions such as carbon dioxide. Ecological footprint is a measure of how much area of biologically productive land and water an individual population or activity requires to produce all the resources it consumes and to absorb the waste it generates using prevailing technology and resource management practices.

Our current globe situation, since the 1920s is that humanity has been in ecological overshoot with annual demand on resources exceeding what earth can regenerate each year. It now takes the earth one year to regenerate what we use in a year. We maintain this overshoot by liquidating the earth's resources. Overshoot is actually threat to human well-being and the health of the planet particularly for India with the population of over 130 crores and such important subject is not being adequately addressed.

The earth planet has well connected natural system and the earth system science involves:
- Explaining interactions among the major components of earth's system e.g. the biosphere, atmosphere, energy system, etc., distinguishing nature from human induced cause of change, understanding and predicting the consequences of change.

The main flows of nature are carbon and oxygen flow. Oxygen is necessary for breathing & carbon is the most important part of molecules. Carbon flow is known as "carbon cycle". Carbon is a major courier of energy. The carbon cycle is out of balance and as concentration of CO₂ and greenhouse gases increases, the earth is undergoing "Global warming and climate change". The impact of present environment can be considered in two ways; 1st we use resources, 2nd we dump wastes (waste in the liquid, solid or gas forms. Both of the things harm environment). The Impacts: shortage of clean and accessible fresh water, degradation of terrestrial and aquatic ecosystems increase in the soil erosion, loss of biodiversity, change in the chemistry of atmosphere, possibility of significant change in climate.

The biggest challenge is not only shortage of resources for the future but also protecting ourselves from environmental hazards. Global warming and climate change are the biggest problem and its major contribution comes from the burning of fossil fuels and cement manufacture as both processes involve major emission of CO₂.

Process of change: Important threads for change.....

Reducing, reusing, recycling and recovering.

Re-engineering the material we use by recycling and use of construction demolition waste

Use of energy, materials and water with increased efficiency for its production and induction while reducing for impact on human health and environment during the life cycle; up to demolition, recycle and reuse.

Understanding and managing the raw materials available, minimize the embodied energy and CO₂ emissions, lowering cement consumption through mechanization and admixtures, water efficiency.

Water efficiency:

Efficient use of water by use of recycled waste water instead of potable or irrigation

Water efficiency in air conditioning system

Innovative waste water technologies

Establish performance goals for energy.

Water, materials and indoor environmental quality along with other sustainable design tools

Role of engineers in achieving sustainable development goals is significant and relevant in today's context.

The engineering profession today needs to explore, develop, adopt use of new and emerging technologies which are not only cost effective but are also sustainable and support inclusive growth that integrates the common man and at the same time maintains environment balance for better quality of life of people.

We need to bring out the changes in design and construction practices with greater emphasis on protection of the environment, reduce consumption of natural resource, and avoid large scale excavations for earth work by using soil stabilization technique and stabilization of hilly slopes without disturbing the ecology of different regions in the North eastern region (mountainous strata). Country as India has varying climate, varying geology and natural resources giving unique challenges which is specific to a particular region requiring specific solutions for achieving the construction cost optimization and reduction in construction period.

The new technology and the knowledge gained by engineers shall enable them to provide safe, durable, cost effective and sustainable construction.

By adopting sustainability, reduce human exposure to hazardous material, maximize use of renewable energy, conserve non-renewable energy and scarce materials, efficient use of water, energy, protect and restore local air, water, soil, flora and fauna, minimize materials impact by employing green products, use of construction and demolition waste by recycling and reuse.



Dr. S.K. Dhawan
GC member IAStructE&
Former Chief Engineer, CPWD

IAStructE student chapter activities

The IAStructE student chapter at CEPT University organizes events to provide a window of exposure and professional discussions for like-minded structural engineering students and fresh graduates (less than 2 years of experience).

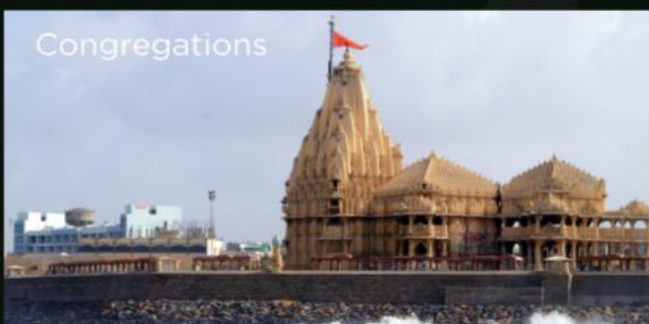
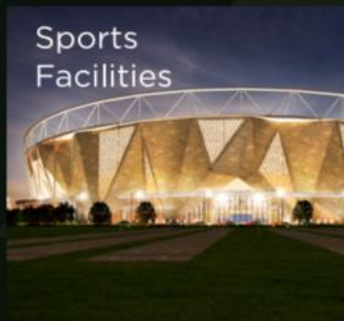
Upcoming event(s): **Structural needs of heritage structures**

More details of upcoming events and workshops by IAStructE student chapter at CEPT University will be posted by the student committee on their facebook page, <https://www.facebook.com/iastructecept/>. For personal enquiry, contact padia.jaimin.bt15@cept.ac.in (committee member of student chapter)

FUJI

Creating foundations of excellence in India

FUJI has embraced the culture of India positively and put their right foot down to bring in a revolution in the construction sector. FUJI provides comprehensive precast concrete solutions for assisting the rapid and efficient development of infrastructure projects all around India.



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About IAStructE

The Indian Association of Structural Engineers (IAStructE) is the national apex body of structural engineers in India established with the objective to cater to the overall professional needs of structural engineers. The association has become the source of expertise and information concerning all issues that involve structural engineering and public safety within the built environment. It has no commercial aim or objective. IAStructE is purely a professional learned society with the prime objective of supporting and protecting the profession of structural engineering by upholding professional standards and acting as a mouthpiece for structural engineers. IAStructE endeavors to ensure that its members develop the necessary skill in structural engineering and work to the highest standards by maintaining a commitment to professional ethics and standards within structural engineering. IAStructE strives for continued technical excellence; advancing safety and innovation across the built environment. It also strives to make available to the Government, Public Sector and Private Sector - a credible source of well qualified and experienced Structural Engineers. A nationwide database of Structural Engineers has been compiled and is being constantly updated. IAStructE undertakes a broad range of technical activities which are aimed at information sharing and capacity building. The association provides opportunity for all the members to develop various skills in structural engineering and helps members to be at the forefront of structural engineering practice. Towards achievement of its aims and objectives, IAStructE is engaged in organizing the following: CPD Courses for Professionals at all levels Refresher Courses for Fresh Graduate Engineers, Student's orientation program, Seminars/Workshops, Technical Lectures by Experts, Technical Discussions on Contentious Issues. IAStructE is currently operating from four regional centers. These regional centers located in the Eastern, Western, Northern and Southern parts of the country effectively cater to the professional needs of members residing/practicing all over the country.

How to become a member?

Membership form and details are available at <http://www.iastructe.co.in/membership-form.html>
For membership information and other details contact the Indian Association of Structural Engineers Secretariat.

Membership Benefits

Membership of IAStructE is a sought after professional accreditation. Your membership of IAStructE can help you enhance your intellectual, academic, technical and professional status. It provides inter connectivity to the fellow professionals and the fraternity. Some of the benefits of membership is provided below:

- Complimentary magazine subscription: All members (except Student Members) receive a complimentary subscription to the Institution's flagship publication 'Structural Engineering Digest' (SED). Published quarterly, each issue allows members to remain connected to the association through the provision of technical papers, Industry and Institution News, Featured articles, Professional Guidance on everyday matters affecting the practicing structural engineers. [Released]
- Access to all Technical Lectures, organized every month, at no charge
- Access to Technical Discussions held regularly
- Access to the association's library (Including e-library)
- Discounts in attending Seminars and Workshops organized by the association
- Full on-line access to the current volume and entire e-archive of journal "Structural Engineering Digest (SED)", Refresher Course Materials, Technical Lectures E-Newsletters and other Technical Resources of the Association.
- Opportunity to network with professional structural engineers of eminence and to meet potential employers in the association.
- Opportunities for professional development

IAStructE Secretariat

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