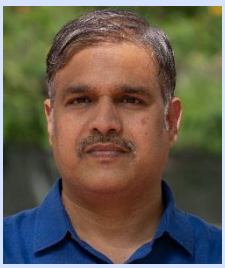
IAStructE news letter

Newsletter of the Indian Association of Structural Engineers

www.iastructe.co.in March 2024

MESSAGE FROM THE PRESIDENT



Dear Friends,

Warm greetings from IAStructE.

I am very happy to present to you the third Newsletter of the year 2024. Besides this the association is regularly organising technical activities for the benefit of structural engineering fraternity. You may find details of such activities and publications in this newsletter and on our website. If you are not yet a member of IAStructE, kindly become a member to avail yourself of the many benefits of the association.

In this newsletter, information related to the launch of the first online international workshop "Forensic Structural Engineering", jointly organized by IAStructE and fib. Also, a news of IIIT Hyderabad student chapter organized technical visit to CSIR-NGRI on 20th March 2024.

Please send your feedback on our activities and suggestions for further improvements.

Best Regards,

Prof. R. Pradeep Kumar
President-IAStructE

FROM THE EDITOR'S DESK

Dear Readers,

The latest edition of this year's newsletter features a significant article on the recent Baltimore bridge collapse contributed by our past president, Mr. Alok Bhowmick. He has taken the initiative to share valuable lessons learned for the benefit of our fellow members. We encourage readers to submit their peer-reviewed publications in journals or any notable achievements for publication in the newsletter, enriching the knowledge-sharing among our community.

Furthermore, we urge everyone to stay updated with our organization's activities by following us on social media platforms and spreading the word among your networks. Together, let's continue to foster a culture of learning and collaboration within our community.
Thanks and regards,

Prof. Visalakshi Talakokula

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Events Organized:

Online International Orientation Course on "Forensic Structural Engineering "

The course on "Forensic Structural Engineering" has been launched on 30th March 2024, which is being jointly organized by IAStructE and *fib*. The course will continue 27th April 2024. The lectures is being organized on every Saturday between 3 PM to 05:30 PM (IST). The inaugural session featured a welcome address by Prof. R. Pradeep Kumar, President of IAStructE, Prof. Stephen Foster, President, *fib* and Dr David Fernández-Ordóñez, Secretary General, *fib*. Mr. V. N. Heggade, Vice Preisdent (West), IAStructE is the Course Coordinator and Moderator. The course received sponsorship from S. P. Singla Constructions Pvt Ltd, Maurer-Sanfield India Pvt Ltd, Mageba Bridge Products Pvt Ltd, Scon Infra Prestress LLP, J. K. Prestressing Co., Tata Projects Ltd, Long Span Structures Pvt Ltd, VSL India Pvt Ltd, Hilti India Ltd, Freyssinet Menard India Private Limited, and Geo Dynamics. Following eminent speakers delivered their lectures during the Inaugural Session:

- Dr. Harshavardhan Subbarao, Chairman & Managing Director, Construma Consultancy
- Mr. V. N. Heggade, Founder & CEO, DECon Complete Solutions, India
- Mr. Rajiv Ahuja, S. P. Singla Constructions Pvt ltd
- Mr. Jitendra Rathore, COO, Maurer-Sanfield India Ltd

Fig1. Glimpses of Inaugural session

IAStructE Student Chapters Activities:

IAStructE – IIIT Hyderabad Student Chapter Event:

1. Title of the event: A Trip to CSIR - NGRI, Hyderabad

Date & Venue: 20th March 2024 at CSIR-National Geophysical Research Institute (NGRI) Hyderabad

The IAStructE – IIIT Hyderabad student chapter of the Earthquake Engineering Research Centre organized an educational trip to the CSIR-National Geophysical Research Institute (NGRI) Hyderabad. The postgraduate students, Ph.D. scholars, and research interns attended the trip. Firstly, the students visited the 'Seismological Observatory' where Dr. Vijaya Raghavan (Chief Scientist, Earthquake Hazard Studies) and his team briefed about the historical significance of the observatory, followed by insights into terminologies surrounding earthquake research such as plate tectonics, seismograms, seismographs, earthquake alert systems, epicenter determination, etc. The students observed the earthquake vault, where data concerning different earthquakes that have occurred in the past were stored either in the form of manual data logs or digitized forms. The students had the opportunity to see the seismograms and earthquake data.

Next, the students visited the 'Groundwater Building', where the introduction to Airborne Electromagnetics (AEMs), a technology that uses electromagnetic waves and Di-electric properties of materials to locate groundwater aquifers, was demonstrated. The students were given an intriguing demonstration of the Ground Penetrating Radar (GPR), a device widely applied for rapid and precise mapping of near-surface structures and is used for data collection for civil engineering, environmental, archaeological, and geological features. Dr. Sakram Gugulothu (Scientist, Geology, Remote Sensing, and GIS Group) led the demonstration. Further, the students en route to the 'Open Rock Museum' to see different types of rocks with ages ranging from 3.3 billion years to around 55 million years of the earth's history. Dr. E.V.S.S.K Babu (Chief Scientist, Geochronology and Isotope Studies) shared a glimpse into the earth's geological history, highlighting concepts of rock and mineral formations and India's geological composition.

In addition, the students visited a few more labs like the Magnetotellurics (MT) Processing Lab, where Dr. Prasanta K. Patro (Chief Scientist, Magnetotellurics) briefed the students with concepts of electromagnetics, rock strata sensing, and frequency-based material identification. Dr. Anita Devi (Scientist, Magnetotellurics) demonstrated to the students how to measure the electrical resistivity of the sub-surface using variations of the earth's magnetic and electric fields. Next came the Thermal Geophysics, Rock Mechanics, and Paleomagnetism lab, where the team of Dr. Venkateshwarlu M (Senior Principal Scientist), Dr. A.V. Satyakumar (Scientist), and Dr. Ramesh Babu N (Senior Technical Officer) explained about the earth's magnetic field preserved in rocks. The team demonstrated cutting-edge devices used for their research, which included the Portable Spinning Magnetometer, AF & Thermal Demagnetizer, and Advanced Variable Field Translation Balance (AVFTB).

Finally, the tour concluded with a visit to the Thermal Conductivity Lab and Radioactivity Lab. Dr. Nishu Chopra (Scientist) gave insights into concepts such as Geothermal Gradient and steady and Transient Thermal Conductivity. Along with this, the equipment used to measure these parameters was also shown. In the Radioactivity Lab, the group was briefed on Gamma-Ray Spectrometry, which is used for geological mapping of rock alteration and concentration of radioactive elements. Overall, it was a joyful and learning experience.

Fig 2. Glimpses of the visit

2. Tittle of the event: IIITH's annual R&D Showcase

Date & Venue: 16th and 17th March 2024

Proceedings of the event: The students of the IAStructE – IIIT Hyderabad student chapter from the Earthquake Engineering Research Centre (EERC) participated in IIITH's annual R&D Showcase. The students presented their research work, projects, and innovative ideas through posters and physical models/demos. The event commenced with an opening ceremony, welcoming participants and attendees. Following the ceremony, the poster presentation and model showcase began simultaneously in designated areas of the venue. This year's showcase was themed "Interconnect

and its Relevance between Algorithms, Ethics, and Society". The students have presented multiple posters on the following topics:

- Analysis of structures using MATLAB GUI and FEM
- Masonry material properties and construction techniques for historical buildings
- Structural restoration
- Structural behaviour of masonry and RC systems
- Seismic behaviour of non-structural elements, etc.

In addition, the display of physical models and demos added a tangible and visually compelling dimension to the event. These models served as dynamic representations of theoretical concepts, providing attendees with a hands-on opportunity to engage with the research more interactively. Some of the mentioned models that students had developed are as follows:

- A structure with braced and unbraced system
- Model demonstrating the effect of structure's height on the time period
- Seismograph
- Kath Kuni House
- Earth's Interior Composition and Faults
- Base Isolation System, etc.

The showcase provided a unique opportunity for the viewers to interact with faculty and students, gaining insights into their work through demos, prototypes, and presentations. This interactive experience facilitated a deeper understanding of the research undertaken at IIITH, emphasizing its practical applications and societal impact. In conclusion, the event was a grand success. Thanks to the collaborative efforts of all involved. The students' dedication and enthusiasm were instrumental in creating an enriching and memorable experience for all.

The IAStructE DTU Student Chapter, within the Department of Civil Engineering, recently orchestrated an engaging Infrahack Quiz as part of Civil Connect 2024. In addition to showcasing the students' aptitude for civil engineering, this event provided a forum for cooperation and intellectual interchange. Putting an emphasis on creativity and problem-solving, participants were pushed to consider infrastructure design and how it affects society critically.

Fig 2. Glimpses of an event

3. Tittle of the event: A Visit to NRSC-ISRO, Hyderabad

Date & Venue: 28th March 2024, NRSC – **N**ational **R**emote **S**ensing **C**entre, a division of ISRO, Hyderabad

Proceedings of the event: The IAStructE – IIIT Hyderabad student chapter of the Earthquake Engineering Research Centre organized an educational visit to the NRSC – **N**ational **R**emote **S**ensing **C**entre, a division of ISRO, Hyderabad on 28th March 2024. This excursion was joined by the PG students, doctoral students, summer interns, staff and a faculty.

The visit started off with a first presentation by Dr. Srinivas Reddy (Senior Scientist), overviewing the history of NRSC, the different ISRO units in India, satellites launched by ISRO such as the SLV3, ASLV, PSLV XL, etc., and their satellite orbits. Another aspect of the presentation focused on the preparation and launch of satellites using rockets. This included detailed explanations on how satellites and rockets are readied for launch, the various stages involved in a satellite launch, and the types of fuel (e.g., Liquid Hydrogen, Dimethyl Hydrazine, etc.) used during different phases of the launch process. For better understanding, a video demonstration was incorporated, showcasing the entire process from preparation to launch. Dr. Reddy also emphasized on additional concepts related to remote sensing, including the distinctions between active and passive sensors, as well as the operational range for satellite data collection. The presentation concluded by throwing light on geospatial applications of remote sensing in the fields of agriculture, water resources, forestry and ecology, military and defence needs, disaster management support, etc., showcasing the broad spectrum of benefits derived from remote sensing in various fields.

The second presentation conducted by Dr. Priyom Roy (Scientist) from Mineral Exploration and Geohazards Division of NRSC, focused on space data and geospatial models for landslides and earthquakes. Dr. Roy discussed different case studies of the fatal landslides in the past, which transitioned into various concepts such as landslide inventory mapping using satellites, susceptibility mapping using machine learning (ML) to understand landslide prone regions, landslide warning systems and landslide predection using InSAR technique. Dr. Roy also highlighted the studies on earthquake related concepts such as strain analysis, CORS Network to measure plate movements for calculating earthquake strains, India on geohazards, etc., in depth. Further, he explained the seismic hazard zoning, mapping deformation, and an overview of the NISAR (NASA-ISRO Synthetic Aperture Radar) mission. In both the presentations, there was a brainstorming question and answer session between the speakers and the students.

The students also got the opportunity to explore the NRSC exhibition and showcase of the models depicting rockets, satellites, deep space antennas (data receivers), polar orbits, etc. In addition, there were a wide variety of posters and photographs on display outlining various geographical landmarks, aftermath of natural calamities, and mosaics (aerial photographs). Overall, it was an interactive and enriching learning experience for all.

Fig 3. Glimpses of the visit

Forthcoming Events:

Event	***Speakers***	***Date & Timing***	***Place***
Webinar on "Role of Structural Engineers in Climate Crisis" **Registration link:** https://us02web.zoom.us/webinar/register/WN_yzcitayOSGOxDReTrGzVLw	Dr. Natasha Watson, Embodied Carbon Lead, UK Structures, Buro Happold	05.04.2024 at 03:00 PM (IST)	Online through Zoom

IAStructE Library:

IAStructE has set up a library at K-69 A, Basement Kalkaji, New Delhi. It has a collection of good technical books and journals related to civil & structural engineering. Members staying in the vicinity are encouraged to utilize this facility, and if you want to contribute your books and journal to the library you are always welcomed.

Fig 4 IAStructE Library

Message from IAStructE social media & Digitization Committee

Let's get "***DIGITIZED***"

With all new look of our website and media handles, please follow us on all major media platforms. For joining us, below mentioned links to be pasted in browser. Let's join hands together to promote the profession of Civil Engineering.

1. **on TWITTER** as **IAStructE: -**https://twitter.com/iastructe
2. **on Facebook** as **IAStructE: -**https://www.facebook.com/IAStructE-100114022302316
3. **on LinkedIn: -**The group is defined as Indian Association of Structural Engineers-IAStructE
   https://www.linkedin.com/groups/6646248/
4. **on YouTube** as **IAStructE Webinar: -** Subscribe and press bell icon
   https://www.youtube.com/channel/UCvv7ojXO9Dxq1WtP_yHZTKw

Member's Published Articles/Publications:

Journal Publications:

1. Tushar Bansal and Visalakshi Talakokula (2024), "Comparative analysis of very-early age hydration process: LC3 vs. conventional and blended cement pastes using embedded piezo sensors", Measurement, Volume 229, April 2024, 114433.
https://doi.org/10.1016/j.measurement.2024.114433 *Impact Factor: 5.131*

2. Kefei Li · Junjie Zeng….. **Visalakshi Talakokula** et al., (2024), "RILEM recommendation from TC 289-DCM: guideline for designing and operating long-term marine exposure sites", Materials and Structures (2024) 57:44,
https://doi.org/10.1617/s11527-024-02319-9 ***Impact Factor: 3.427***

Article:

LESSONS LEARNT BY BRIDGE OWNERS AND BRIDGE DESIGNERS FROM BALTIMORE BRIDGE COLLAPSE

Alok Bhowmick, FNAE, IntPE(India)
Managing Director, B&S Engineering Consultants Pvt. Ltd.

1. Background

On March 26, 2024, at around 01:27 Eastern Daylight Time (EDT), the main navigational span of Francis Scott Key Bridge at Baltimore (USA), including 5 other adjacent spans collapsed, when a container ship collided with one of the support piers. Fig. 1 shows the location of the bridge and the route taken by the ship before collapse. The incident has raised serious concerns about the safety of critical bridges across major streams, which are exposed to the risk of ship/barge vessel collision.

This brief note is prepared with the objective of explaining why this tragedy occurred. What lessons bridge owners, bridge engineers, and maritime engineers have learned from this failure? How can we make our existing bridges safer against such possibilities? And what changes we need to bring into our codes, standards, and practices to ensure that the existing stock of bridges as well as the new bridges that we build are safer.

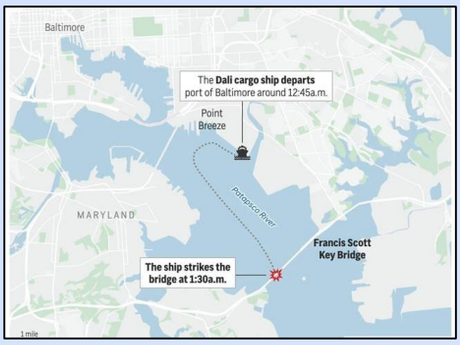


Fig. 1 : Map showing location of the bridge

Before I get to the subject, I wish to take this opportunity to express my deepest condolences to the families and friends of all those who lost their lives in this tragedy or who are still missing. My sympathies go to all those who are affected by this tragedy.

2. Salient Features of Francis Scott Key Bridge at Baltimore

The **Francis Scott Key Bridge** (named after the amateur poet Francis Scott Key (1779–1843), the author of the American national anthem), was a steel arch-shaped continuous through truss bridge structure that combines the behaviors of an arch, truss, and cantilever. The bridge spans the lower Patapsco River and carried Maryland Route 695 in Baltimore, Maryland, United States. It was opened to traffic nearly 47 years ago, in the year 1977. It used to carry an estimated 11.5 million vehicles annually (i.e. ~31,500 vehicles per day).

Total length of this 4 lane bridge is 2632.25m. The span arrangement of this bridge comprised of 25 nos x 30.48m + 9 nos x 91.44m + main span module of (219.46m + 365.76m + 219.46m). The main central navigational span through which all ships / barges pass is of length 365.76m. It was the second longest continuous trussed bridge in USA. Fig. 1 below shows the span arrangement of the bridge. The foundation hit by the ship is highlighted in this sketch and the portion of superstructure which collapsed is marked in RED. A total of 6 spans came down covering a length of 1079m of the bridge. Fig. 2 shows the photograph of the bridge when it was operational

Fig. 1 : Span Arrangement of the Collapsed portion of Bridge

3. Why did this bridge collapse?

The collapse of this bridge has a significant social, environmental and financial impact. It raises questions about the responsibilities of the various parties involved. The National Transportation Safety Board (NTSB) is investigating the case to determine the official cause of the collapse. The findings of the investigation will help determine if any parties, such as the ship operator, maritime board or bridge maintenance authorities, bear legal responsibility for the incident. Until NTSB finalizes its investigation into the disaster, it's not possible to say with certainty what is the prime cause of collapse. However from the perspective of a bridge / structural engineer, it is clear that there are several secondary causes of collapse and planning, design and construction of this bridge is certainly one of them. Some of the issues pertaining to bridge planning and design are discussed below:

a) The bridge was neither designed to withstand the impact from the kind of vessel which hit the bridge, nor was there any significant protection measures provided to mitigate the impact of such forces.

b) As can be seen from Fig. 2, the piers looks too flimsy to take the impact of ships. Perhaps the piers are not designed for ship impact at all.

c) There are small dolphins provided (the small round objects visible in the figure), on each side of the bridge piers as protection measures. These dolphins are again too flimsy compared to the size of ships plying and they have not been able to prevent the vessel from hitting the sleek pier. Protection system against such ships had to be much more robust and big-sized, matching with the ship size and its DWT. For the sake of comparison, collision protection system of Penang Bridge, Malaysia (1985 construction), is shown below in Fig. 3 which can be compared with the protection system provided in this bridge.

Fig. 2 : Photo of the Bridge before collapse

Fig. 3 : Collision Protection System of Penang Bridge, Malaysia

d) The width of the navigational channel of 365.76m provided in this bridge is perhaps on the lower side for the kind of vessels plying in this route. The bridge constitutes a bottleneck in this case, when the ships are passing under this bridge. This could be one major reason for

the tragedy. The width of navigational channel to be kept depends on the length of vessels passing the bridge and its design speed. A bumper zone of at least 3.2L is recommended for navigation, in case the ships are allowed to cross the bridge at normal speed. This requirement can be reduced to 1.6L in case ships are allowed to pass with restricted speed. 'L' is the maximum length of vessel. In this case, the vessel which collided was having a length of 300m. Even if we consider this length as the maximum length of ship which passes this bridge, the minimum width of navigational channel required here is at least 480m. Therefore a cable stayed bridge would have been more appropriate in this case. In the 1970s, when this bridge was conceptualized and constructed, ships were dramatically smaller in size and perhaps engineers would not have foreseen the need for a longer main span in this bridge and could not have imagined the kind of container ships that are plying today. It is hoped that the replacement bridge will consider providing a longer navigational span at this crossing.

e) The steel arch-shaped continuous through truss bridge structure provided in this bridge is a fracture-critical continuous structure. Failure of any member of such bridge would lead to a progressive collapse, which has actually happened. This criticality of the structural arrangement makes this bridge vulnerable and a candidate for more robust arrangement of ship protection system, which should have been provided.

f) The cargo ship DALI which took down the Baltimore bridge, is a mid-sized container ship having length overall (LOA) of 299.92 meters and width of 48.2 meters. At the time of collapse, the ship was carrying 4700 containers though it has capacity of carrying 10,000 containers. The DWT of the ship was about 120,000 tonnes.

g) Fig. 4 below shows the phenomenal growth in size and capacity of ships over last 50 years. It can be seen that the size and DWT of ships have grown more than 8 times over last 50 years. This bridge therefore could not have resisted the impact of the container ship.

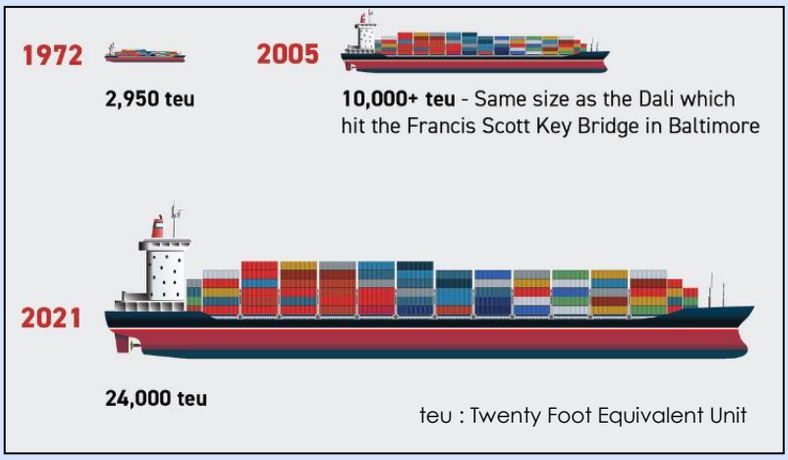


Fig. 4 : Development of Size of Ships with time

4. Lessons learnt from this failure?

a) Failure of Francis Skott Key Bridge at Baltimore is a wakeup call to all bridge owners and bridge designers across the globe. The frequency of such accidents and the severity of their consequences can increase, unless mitigation measures are quickly adopted.

b) As modern cargo ships are getting larger in size and DWT, there is an urgent need to revisit the present national and international standards on provision of ship/barge collision into bridges.

c) Old and existing bridges in major navigational channels must be protected from the risk of vessel collision. Protecting these assets will be far more cost effective than taking the risk of loosing a bridge and facing the consequences

d) Within other engineering constraints, bridge piers in navigational channels should be massive and robust and capable of resisting the impact of vessels passing in the channel, unless piers are protected from vessel collisions by independent structures such as artificial islands, structural barriers, dolphins, protective cells, and moored pontoons.

e) India has about 14500 km of navigable waterways currently. This includes rivers, backwaters, canals, creeks, and so on. Till 2016, there were only 5 national waterways. But in 2016, 106 additional national waterways were added in the National Waterways. This means that all the existing bridges of pre-2016 construction, are not designed for any barge impact forces and they are vulnerable. It is important to carry out a study to identify the risk for all these vulnerable bridges and come out with protection measures to mitigate risk of failures.

f) This paper only deals with the preventive and corrective actions which can be taken by Bridge Designers and Planners. There are other factors (shipboard, external, environmental) which has influence on vessel-bridge collision. This is not dealt with in this brief article.

5. Conclusions

The wisdom of learning from failure is incontrovertible. Let us not loose any opportunity to learn lessons from failure studies. It's not always necessary to learn from your own mistakes. You can learn from other's mistakes too.

Call for papers for CROSFALL:

CROSFALL is a newsletter created by Indian Association of Structural Engineers (IAStructE). Its purpose is to share lessons learnt from structural failures, near-misses and safety concerns. CROSFALL is greatly encouraged and inspired by CROSS (Confidential Reporting on Structural Safety), UK, which is a collaborative effort of three institutions (IStructE, ICE and IFE). **There is however no connection between CROSFALL-IAStructE and CROSS-UK**

CROSFALL Editorial Board invites reports for the forthcoming issues. Interested candidates can sent the reports about structural safety issues related to all types of structures (i.e. buildings, bridges, tunnels, industrial structures etc.) in the built environment. The reporting can be related to:

- *Structural failures,*
- *Poor Design and Detailing, Lack of Seismic Safety in planning*
- *Safety concerns about high risk erection schemes at Site*
- *Safety concerns on Temporary Works*
- *Near misses, or observations relating to procedures followed at site, which may lead to failures or collapses.*

Reports do not have to be about current activities so long as they are relevant. Small scale events are equally important - they can be the precursors to more major failures. Report might relate to a specific experience or it could be based on a series of experiences indicating a trend. No concern is too small to be reported and conversely nothing is too large. Reports should aim to include information that will help others to learn from the safety issue identified.

To submit the report please go through the following link: www.iastructe.co.in/crosfall.php

Call for papers for the theme-based issue of SED journal:

SED Editorial Board invites article contributions for the forthcoming issue of the Structural Engineering Digest on the following themes, which shall be published in e-book format. Details are as under:

April-June 2024 issue: Theme: Industrial Structures
Guest Editor: Mr. V. N. Heggade

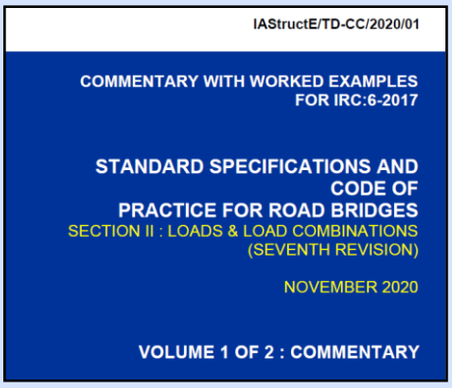
Sub-theme:

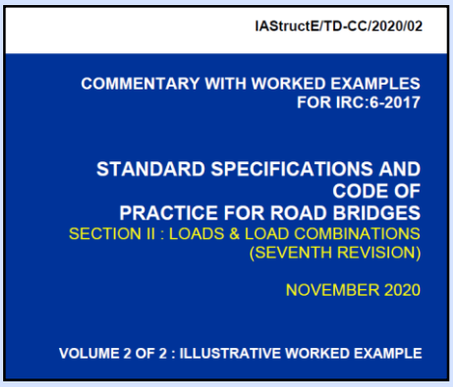
- Industrial Cooling towers and chimneys
- Factory Buildings
- Balance of plant structures in nuclear power plants, Thermal power plants, and hydel power plants
- Structures in steel and cement plants

Interested professionals may send their full paper on any of the above issues along with their photograph and brief resume latest by 15 March 2024 or at the earliest convenience. Articles are invited from i) Members of IAStructE; ii) Specialists in the field even though they are not members of IAStructE.

IAStructE Publications:

1. Commentary with Worked Examples for IRC: 6-2017: It is a document having commentary with worked example on IRC: 6-2017 (The code for Loads & Load Combinations for design of Highway Bridges). This commentary is in two separate volumes. Volume-1 pertains to the Commentary while Volume-2 pertains to Illustrative Worked Examples. It has 48 worked examples demonstrating application of various codal clauses.



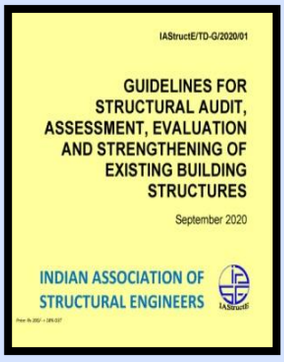


It's a priced document and hence not freely downloadable.

The documents are available for sale @ Rs. 1200/- for Volume 1, and @ Rs. 800/- for Volume II. Members of IAStructE and IRC will be entitled for a discount of 10% on this amount. Interested professionals who wish to purchase the commentary may kindly register with the following link or contact IAStructE Secretariat at **iastructe@gmail.com**

Registration link: **http://iastructe.co.in/new-iastructe-publication.php.**

2. Guidelines for Structural Audit, Assessment, Evaluation and Strengthening of Existing buildings Structures: This document will guide structural engineers in proper assessment of building structures before issuing structural stability certificate. These guidelines may be used by IAStructE members, all other structural engineers, house owners, housing society welfare associations, clients and corporation engineers for understanding structural audit of the private and public building structures. The Guideline focuses on the urgent need to strengthen risk resilience of buildings from any kind of risks due to earthquake and other hazards. It is hoped that this document will be useful to ensure that all structures across the country remain safe from any kind of disaster risk.



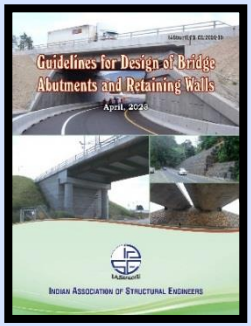
It's a priced document and hence not freely downloadable.

The price of this e-document is Rs 200/-. Interested professionals, who wish to obtain the soft version of the Guideline in pdf format, may register with the following link. Registration Link: **http://iastructe.co.in/guidelines-for-structural-audit.php**

3. Commentary on IS: 13920: The commentary is available on www.iastructe.co.in under IAStructE Professional Documents. IAStructE member can access this document after login.

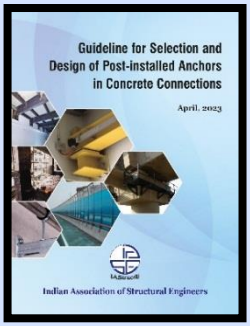
4. Commentary on IS: 1893 Part 1: The commentary is available on www.iastructe.co.in under IAStructE Professional Documents. IAStructE member can access this document after login.

5. Guidelines for Design of Bridge Abutments and Retaining Walls: This document will assist practicing bridge and structural engineers in building confidence in the design of these structures, which offers tools for the design of economic and innovative retaining structures. The document is rich in theoretical explanations and draws on much experience of the authors. Worked examples further illustrate the application of the applicable codes and should promote better understanding.



The document is available for sale @ Rs. 1500/-. Interested professionals who wish to purchase this document may kindly contact IAStructE Secretariat at **iastructe@gmail.com**

6. Guideline for Selection and Design of Post-installed Anchors in Concrete Connections: In this document, only post-installed anchors are covered including their types, behaviour and working principles, failure modes, and basic design steps for non-seismic and seismic situations. A few illustrative design examples too are presented for better understanding of design methodology. This document is now available on www.iastructe.co.in under IAStructE Professional Documents. IAStructE member can access this document after login.



IAStructE is now a Statutory Member of fib:

Indian Association of Structural Engineers
is now a
Statutory Member of *fib*

We are delighted to announce that IAStructE has become the Statutory Member of *fib* and Indian National Member Group representing India in *fib* general assembly.

The *fib*, which is "The International Federation For Structural Concrete" (Fédération Internationale du béton in French), is a not-for-profit association formed by 41 national member groups, is spread over more than 100 countries. *fib* has approximately 2500 corporate and individual members. The *fib's* mission is to develop at an international level the study of scientific and practical matters capable of advancing the technical, economic, aesthetic and environmental performance of concrete construction.

As a statutory member of *fib*, IAStructE will represent India in the General Assembly and will enjoy the following benefits, which are exclusive to national member groups only:

- **Voting rights in the general assembly of *fib*;**
- **Hosting rights for *fib* congresses and symposia;**
- **Events organised by IAStructE can be co-sponsored by the *fib*;**
- **Rights to nominate candidates for *fib* awards.**

Members of IAStructE will enjoy the following benefits :

- **Opportunity to become a part of fib technical committees and contribute to the *fib* Model Codes (published approximately every 10 years).**
- **Opportunity to become a part of the *fib* Task Groups and Commissions .**
- **Opportunity to be nominated for the *fib* awards thru' IAStructE.**
- **Access to all the bulletins published since the 2022 through IAStructE.**
- **Eligible for 'subscribing' membership by paying discounted subscription fee.**
- **All current publications of *fib* can be purchased at discounted rates.**

More information about the fib publications, bulletins, events, courses, and their proceedings can be obtained from https://www.fib-international.org

INDIAN ASSOCIATION OF STRUCTURAL ENGINEERS
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Accredited Structural Engineers (ASE – IAStructE):

The IAStructE program for Accreditation as Accredited Structural Engineers (ASE – IAStructE) is suitable for practicing structural engineers who have experience in the structural design field and have a good understanding of applicable design codes/standards in India.

This accreditation will help Structural Engineers in India to set a benchmark of proven professional & technical excellence and raise the levels of structural engineering practice in the Country. The entire program would be on the basis of a two-stage process consisting of an interview for the assessment of Initial Professional Development (IPD) followed by a written examination based on actual problem-solving. Applicants have to demonstrate their competence in the designated 12 key attributes on which they will be assessed during the interview. The applicant would then require to clear the examination by answering any single chosen question from the options given in the question paper with a minimum level of marks stipulated. Both stages are mandatory to clear the assessment process and thus to get recognition.

An Accredited Structural Engineer – IAStructE is someone who wishes to:

- validate their comprehensive experience and understanding of all types of structural engineering work and managerial capabilities
- demonstrate their competence on the basis of IPD and Continuous Professional Development activities in the field

Details of the application and assessment requirements, fees, and available dates can be consulted in the relevant fields given in the tabs below. They summarize the general application process, the assessment requirements, and the steps needed to qualify for the ASE-IAStructE accreditation.
The complete information about the entire process along with the application form and annexures can also be obtained from a booklet, which can be downloaded from the following link: https://www.iastructe.co.in/ase-iastructe-accreditation.php

This assessment process will be held bi-annually, being initiated in January & July respectively.

About IAStructE:

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 centres 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.

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.
- ★ Access to the professional documents
- ★ 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

How to become a member?

Membership form and details are available at https://www.iastructe.co.in/membership-grades.php; for more information and other details contact the Indian Association of Structural Engineers Secretariat

Indian Association of Structural Engineers
K-69A, Basement, Kalkaji, New Delhi 110019
Tel: (011) 45794829; Email:iastructe@gmail.com; Website: www.iastructe.co.in

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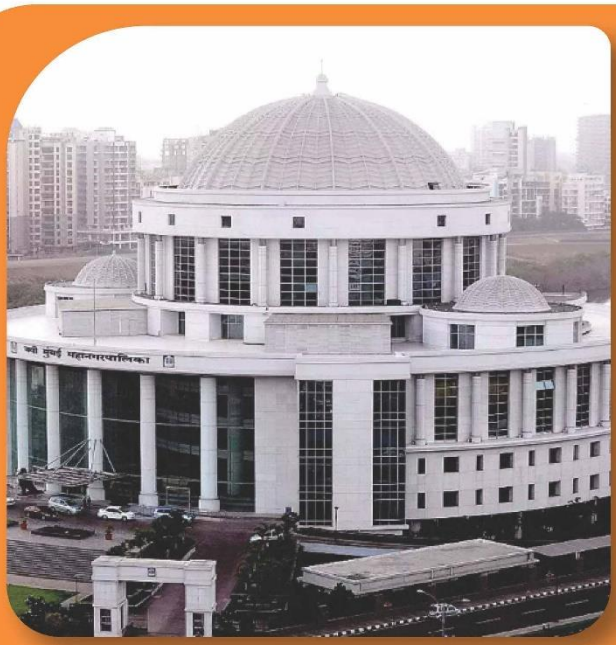

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FACTORY:
Plot No. 76, Babosa Industrial Park, Sarwali village, Nasik highway, Bhiwandi - 421311

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