



STRUCTURAL ENGINEERING

QUARTERLY JOURNAL OF
INDIAN SOCIETY
OF
STRUCTURAL ENGINEERS

ISSE

VOLUME 22-2

APR-MAY-JUN 2020



**GEM 24: ER. MAHENDRA RAJ-INDIA'S MASTER
OF STRUCTURAL ART
SEE PAGE 3**



**USE FERROCEMENT AND
SAVE THE EARTH...
WHICH IS ONLY ONE WE HAVE!!
SEE PAGE 13**

TRIBUTE TO OUR GREAT CIVIL ENGINEERS



PROF. M. D. MULAY



PROF. G. B. CHAUDHARI



ER. JAYAKUMAR SHAH

**NATIONAL LEVEL
FORUM FOR CIVIL
ENGINEERS
SEE PAGE 24**



**KINGFISHER TOWER,
BANGALORE –
A CASE STUDY
SEE PAGE 19**

LET US BUILD A STRONG STRUCTURE OF INDIAN SOCIETY

Steel Connection Design Reinvented

- ANY TOPOLOGY
- ANY LOADING
- IN MINUTES

Overall check

According to AISC/CISC or other design national codes

Stress/Strain analysis

Automatically compose FE models to steel joints

Stiffness analysis

Rotational or transversal stiffness analysis of any connection

Capacity design

Seismic check of all connections

Buckling analysis

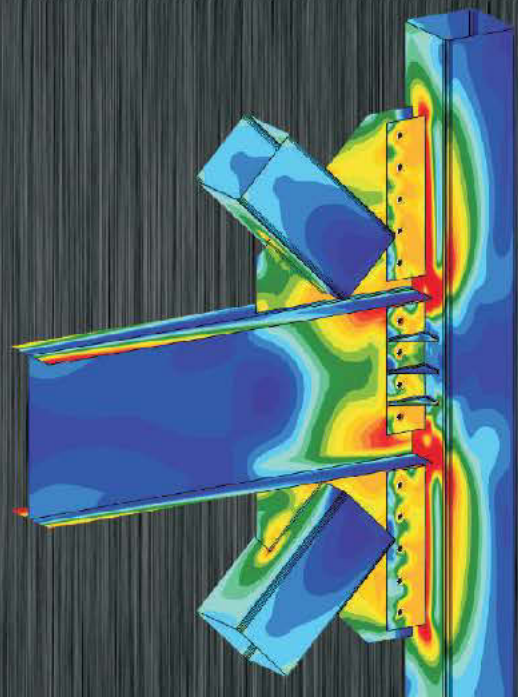
Local buckling effects and critical load factors

Design joint resistance

Maximal joint loads, reserve in joint capacity

Global work

BIM links with the most FEA/CAD software



World wide reference projects



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(Indonesia)



Museum of the
future (Dubai UAE)



Thessaloniki Airport
'Macedonia' (Greece)



Waterloo Station
Redevelopment (London)

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STRUCTURAL ENGINEERS

INDIAN SOCIETY
OF
STRUCTURAL ENGINEERS

ISSE

VOLUME 22-2, APR-MAY-JUN 2020

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Editor : Hemant Vadalkar

Views expressed are authors' or reporters' personal and do not necessarily reflect views of ISSE. ISSE is not responsible for any consequent actions based on contents or information given in the journal.

Fraternity News

WELCOME TO NEW MEMBERS

(APR-MAY-JUN 2020)

1 M 1824 Haridarshan Shivmurat Sonar
 2 M 1825 Sanjay Nautiyal
 3 M 1826 Ramudu Naidu
 4 M 1827 Abhinandan C. Batkadli
 5 M 1828 MuffassirShaikh
 6 M 1829 YogeshDinakarKumbhar
 7 M 1830 PiyushPrakash Desai
 8 M 1831 Prachi Vishal Jadhav
 9 M 1832 M. Vighnesh
 10 M 1833 Gaurav Sancheti
 11 M 1834 Tanmay Narayn Kamath
 12 M 1835 Ramchandra Sh. Parulekar
 13 M 1836 Saharsh Dattagiri Kurde
 14 M 1837 Geeta Shridhar Temkar
 15 M 1838 Mahendra Sharad Patil
 16 M 1839 Rakesh Balkrushna Bhoir
 17 M 1840 Karuna Balleda
 18 M 1841 Manish Ravindra Wadikar
 19 M 1842 Sachin Ramchandra Shelar
 20 M 1843 Nitn Shivkrishna Tongse

21 M 1844 Deep Karsan Bhanushali
 22 M 1845 Ashwini Aditya Shete
 23 M 1846 Vishant Suryakant Vachakal
 24 M 1847 Yash Kamlesh Rathod
 25 M 1848 Vipul Neeraj Khosla
 26 M 1849 G. S. Balkrishana
 27 M 1850 Sanjay Kantarao Kulkarni
 28 M 1851 Vinaykumar Shivshankar Jatti
 29 M 1852 Yogesh V. K.
 30 M 1853 Avinash Vilas Borude
 31 M 1854 Shubham Satish Babar
 32 M 1855 Balaji T. U.
 33 M 1856 Deepak Shankar Gadkari
 34 M 1857 Rajesh M. Borapatre
 35 M 1858 BipinBabulalKhatri
 36 M 1859 Prashantkumar N. Patil
 37 M 1860 SudipGhosh
 38 M 1861 HemantSharad Chore
 02 IM Dhanlakshmisriniwasan Engineering College
 - Prambalpur

Patrons : 38

Organisation Members : 28

Sponsor : 8

Members : 1861

Junior Members 52

IM : 02

Student Members : 159

TOTAL STRENGTH : 2,148

- | | |
|-------------------------------------|--|
| * Structural; Designing & Detailing | * Construction Technology & Management |
| * Computer Software | * Geo-Tech & Foundation Engineering |
| * Materials Technology, Ferrocement | * Environmental Engineering |
| * Teaching, Research % Development | * Non Destructive Testing |
| * Rehabilitation of Structures | * Bridge Engineering |
| | * & Other related branches |

1. To restore the desired status to the Structural Engineer in construction industry and to create awareness about the profession.
2. To define Boundaries of Responsibilities of Structural Engineer, commensurate with remuneration.
3. To get easy registration with Governments, Corporations and similar organizations all over India, for our members.
4. To reformulate Certification policies adopted by various authorities, to remove anomalies.
5. To convince all Govt. & Semi Govt. bodies for directly engaging Structural Engineer for his services.
6. To disseminate information in various fields of Structural Engineering, to all members.

GEM 24: ER. MAHENDRA RAJ-INDIA'S MASTER OF STRUCTURAL ART



by Dr. N. Subramanian

Er. Mahendra Raj (1924 -)

Er. Mahendra Raj, a remarkable pre-computer era structural engineer, designed very unique structures using only his intuition and knowledge of engineering and mathematics.

EARLY LIFE

Born in 1924, he graduated in Civil Engineering in 1946 from Lahore, did his M.S. in Structures in 1956 from Minnesota, USA, and C.E. in Structures from Columbia, New York, USA in 1959. He started his career with Punjab Public Works Department as an Assistant Engineer in 1946, was promoted as an Executive Engineer in 1953 and went to USA for further studies and work experience from 1955 to 1959. On his return he resigned from the Government service and started his independent practice as a civil engineer in 1960.

INNOVATIVE DESIGNER

Er. Mahendra Raj's 60 years of service to the building profession has shown an uncommon inventiveness and willingness to experiment with new concepts. He is considered as one of the most inventive engineers in the country. He has worked with some of the leading and famous Architects of the World such as Le-Corbusier, Minoru Yamasaki, Louis Kahn, Charles Correa, B V Doshi, A P Kanvinde, J A Stein and Raj Rewal. He is internationally acclaimed for his innovative and thought provoking structures, some of which are one-of-a-kind.

Er. Raj is recognized as a master of structural art - a term that hadn't even been coined when he began his career in independent India. An early project was Le Corbusier's urban plan for

Chandigarh, the capital of Punjab. Le Corbusier proved difficult and mistrusting of local engineers, and it was this early experience that brought Er. Raj to fully understand the weighted importance of demonstrating mastery and sophistication in his work. 'Our common objective was to set up practices here, find our own roots and rise to the same stature that other countries had attained,' he explains. 'We sought an Indian idiom that expressed our ancient culture but was in tune with modern times.'

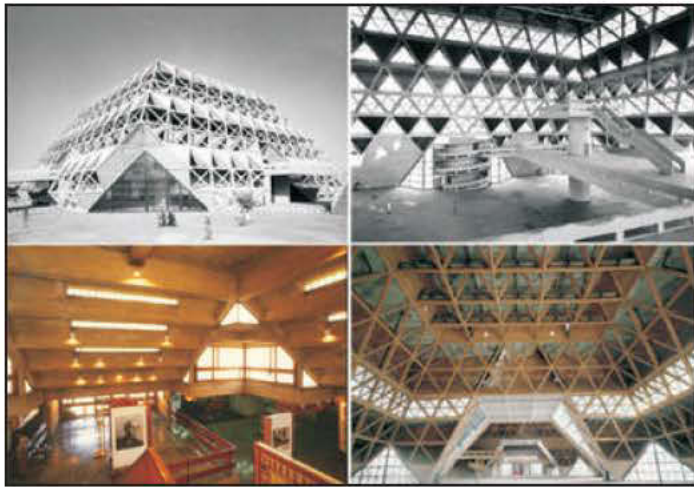
ENGINEERING CONSULTANTS (INDIA) & MAHENDRARAJ CONSULTANTS PVT. LTD.

Er. Mahendra Raj started as an independent consultancy practice in the field of civil and structural engineering in 1960- First in his own name, and later in the name of Engineering Consultants (India) - ECI. Keeping in view the demand of construction industry in India and also to provide consultancy services in neighbouring countries, Mahendra Raj Consultants Pvt. Ltd - MRC, was set up in 1976. The two firms together offer consultancy services to encompass all facets of the civil engineering industry 'from concept to management of projects' within the country and overseas. Every member of the staff keeps abreast with the latest developments in the field of analysis, design, construction management and construction techniques. To achieve this, a well equipped library containing over 5000 technical books and journals are made available along with a state-of-the-art computer facilities.

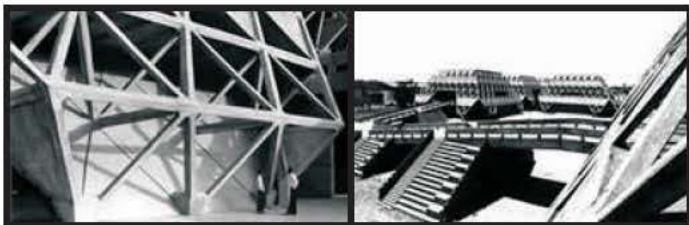
FEW INTERESTING PROJECTS

Some of the projects Er. Mahendra Raj designed are trend setters in the country- many of his structures can be seen as monuments narrating the history of architecture in post-independence India.

Hall of Nations and Halls of Industries, Pragati Maidan, New Delhi, 1971-1972



This fascinating structure was designed as space frame in reinforced concrete- first of its kind in the world (architect Raj Rewal). The 'Hall of Nations' provided an uninterrupted exhibition area of 6,700 m² in a 82m × 82m × 27m high truncated pyramid supported on eight points. Each of the four 'Halls of Industries' is similar in design and is 44m × 44 m × 16m high. Free standing coffered mezzanine floors cantilevering out of cylindrical shafts provide additional exhibition area in each hall.



A special 9 member joint was evolved for precast construction but the builder preferred in-situ construction. Hence, the joint was modified to suit the adopted technique. The 'Halls of Nations' is supported on pile foundations tied together with post tensioned plinth beams stressed in stages-all these techniques were new to India at that time. The 'Hall of Industries' rest on spread footings tied together with high tensile steel bars. The entire complex was analysed, designed and built in a period of fifteen months.

The buildings are acknowledged all around the world as icons of modernity and have found a place in the annals of architecture and Indian cultural history. Unfortunately this outstanding and iconic structure was demolished recently- in spite of the letter written to the Commerce Minister Ms. Nirmala Sitharaman by the Zurich's Swiss Federal Institute of Technology and the Federation of Swiss Architects asking the government to preserve these buildings and termed them as part of India's cultural heritage and an example of engineering marvels.

Usha Kiran, Mumbai, built in 1961

Image courtesy: <https://housing.com/>



A twenty six storey apartment building built using shear walls, can be classified as the pioneer in high-rise structures in India.

Tagore Memorial Theatre, Ahmedabad, 1963-1965



A series of rigid frames in reinforced concrete folded plates provide the outer shell to this hall. Vertical folds are 17m high, increasing in depth from 1.15m at the base to 2.4m at the top with a constant plate thickness of 15cm. Horizontal folds are 2.4m deep and span 33.5m with a plate thickness of 10cm increasing to 15cm near the supports.

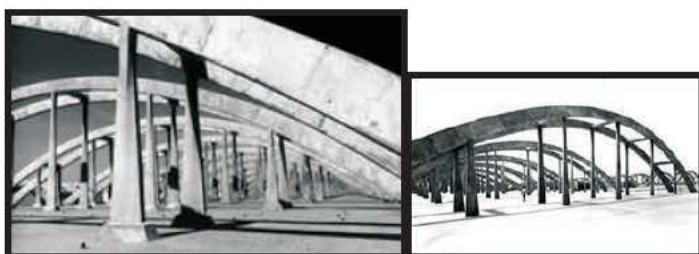


Inside the hall, a 'seating bowl' with a capacity of 700 is supported on an independent structure. Sculptural columns and cantilevers of this bowl dominate the lobby area. The hall, located on the banks of Sabarmati River, is supported on individual and strip footings resting on a sandy

DCM Hindon River Mills, Ghaziabad, 1970



A Delhi Cloth Mills factory to manufacture superfine cloth with a total covered area of 35,400 m². Post-tensioned perforated hollow girders carrying humidified air are suspended from 48 m span, twin concrete arches placed at 15 m centers.



Precast double tee units in reinforced concrete weighing 12 tonnes each are supported on the hollow girders. This structural system provides large 48 m × 225 m working halls for the factory.

NCDC Office Building, New Delhi, 1978-1980



Two inclined wings, 9-storey high, join with the central core at top, to create an open atrium. Each typical floor is 11 m × 25 m column free using one way ribs. Alternate floors are tied together with post tensioned cables. The building houses the offices of the National Cooperative Development Corporation (Architect: Kuldip Singh).

City Centre Civic Block, New Delhi, 1976-1984



This 18 storeyed Civic block of New Delhi Municipal Corporation covers an area of 24,000 m². It is supported on a central core and four shear walls which curve outwards from a width of 28 m at the ninth floor level to a width of 64 m at the ground level; with a large three storey high opening in the two central shear walls to provide an inner atrium. The central shear walls are prestressed in stages and the building is supported on driven cast-in-situ piles.

Covered Sports Stadium, Srinagar, 1979-1982





This covered stadium has a seating capacity of 5,000. The roof is a space frame in steel supported on cladding plates created with intersecting precast concrete, reinforced and post tensioned members, on a triangular grid forming a space structure. Seating frames are connected to the cladding plates and carry precast concrete seating elements. Planned in the shape of a cross with a maximum dimension of 62 m, the stadium is supported on piles tied together with post tensioned plinth beams stressed in stages.

State Trading Corporation Building, New Delhi, 1989



Permanent Mission of India, New York, 1989-1992



This 28 storey building is located at 235 East, 43rd Street, [between 2nd and 3rd Avenue], New York and used for offices and residences of Permanent Indian Mission to the UN Headquarters in USA. It is a concrete framed building on columns and shear walls and has metal cladding (Architect : Charles Correa Associates).



This office building provides storey height concrete vierendeel cantilevering 6m at each end and supported on service shafts located 23m apart (Architect: Raj Rewal). This permits flexible internal planning over an area of 44,000 m². The building, with 23 storey, 18 storey and 12 storey towers, is supported on 18 to 20m long driven cast-in-situ piles.

PROFESSIONAL CONTRIBUTIONS

Er. Mahendra Raj made extensive contributions to the development of Civil Engineering profession in India. He was the President of the Association of Consulting Engineers India (ACEI) for a number of years before it merged with the National Association of Consulting Engineers and was renamed Consulting Engineers Association of India (CEAI). As the President of ACEI, Er Raj sponsored the cause of Consultancy in India for a number of years and has helped in enhancing its credibility.

Er. Mahendra Raj has been very active in framing a legislation for regulating the profession of Engineering in the country, called 'The Engineer's Bill'. His efforts in the past twenty plus years for this cause eventually won support of all professional organisations in India. As a result, the Government of India instituted an 'Engineering Council of India'. Er. Raj was a member of the committee which drafted Rules and Regulations for this Council. Later he was the Vice Chairman of the Council for a number of years. The Government has given an assurance to the Engineering Profession that the legislation of the Engineer's Bill will follow.

Along with some other organizations Er. Raj was, as the President of ACEI, instrumental in the setting up of the Consultancy Development Centre (CDC) under the patronage of the Government of India to promote Consultancy in the Country. He was the Vice Chairman of CDC and held the post for a number of years. He participated actively and made significant contribution towards the formation of Technical Consultancy Development Programme for Asia and Pacific (TCDPAP) under the sponsorship of ESCAP. Er. Mahendra Raj was the first country representative to TCDPAP.

Er. Mahendra Raj has been active in International Federation of Consulting Engineers (FIDIC), since India became a member in 1981. He was a member of the North and South Committee on Needs and Resources (NASCONAR) set up in 1981-82 and later of the Client Consultant Relationship Committee (CCRC) for a number of

years. He has attended and participated in the deliberations at a number of FIDIC conferences in different parts of the world.

Er. Raj was also instrumental in the Indian Association hosting three FIDIC related meetings in Delhi: First, Asia South Pacific Asian countries ASPAC meeting in March 1984, second, FIDIC-Executive Committee meeting in January 1988 both organized by Er. Mahendra Raj as the President of the Association of Consulting Engineers India, ACE(I) and the third, again a FIDIC Executive Committee meeting in January 2001 organized by Consulting Engineers Association of India.

Er. Mahendra Raj was also member of a high-powered committee set up by the Ministry of Urban Development and Poverty Alleviation of the Government of India to draft a Comprehensive Legislation to Regulate and Control the Activities of Builders and Developers.

AWARDS



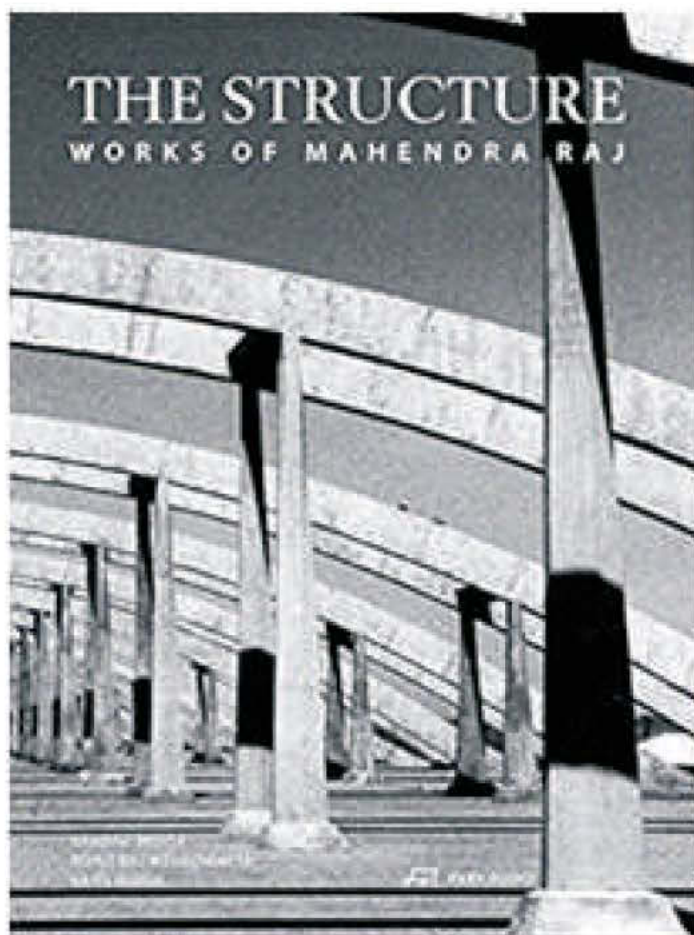
Er. Mahendra Raj receiving The Chairman's Award in the series "Architect of the Year Awards" instituted by J K Cement Works Kanpur from Hon'ble Shri H.D. Deva Gowda, Prime Minister of India in 1996.

Er. Mahendra Raj received recognition from several professional organizations for his outstanding contribution in the field of building industry.

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-
- Institution of Engineers (India) presented "Architectural Engineering Design Award" in 1989-90 in recognition of his outstanding contribution in the field of Architectural Engineering for constructing large span structures, Airlines hangar, designing Skyscrapers, Tagore Memorial Hall at Ahmedabad, Hall of Nations at Pragati Maidan, New Delhi; Stadium at Srinagar, Churches, etc.
 - Association of Consulting Civil Engineers presented the "ACCE GOURAV Award" in 1991.
 - Hon'ble Shri H.D. Deva Gowda, Prime Minister of India in 1996 presented "The Chairman's Award 1995" in the series "Architect of the Year Awards" instituted by J K Cement Works, Kanpur. This was the first time that an award meant for Architects was given to an Engineer "for his outstanding contribution in giving Architecture in India a New Aesthetic dimension through innovative structural Systems".
 - The Indian Concrete Institute presented the "ICI-JI Life Time Achievement Award" in 2000-2001.
 - The Institution of Engineers (India) presented "Scroll of Honour to Eminent Engineer" for his "Significant contribution to the advancement and application of practice of Engineering in India" in 2001.
 - American Concrete Institute presented the "India Chapter of ACI" in 2003 in "appreciation of his contributions of more than five decades of Structural Engineering Practice with outstanding creations, Innovative ideas, challenges to Create New Culture and to Upgrade the Professional Status in India".
 - Consulting Engineers Association of India presented "Certificate of Commendation – Scroll of Honour" in 2005 for 'his Lifetime Contribution to the Engineering Consultancy Profession'.
 - Architect and Interior India Awards 2011 presented "Indian Hall of Fame – Aces of Space Design Award" in 2011.
 - Consulting Engineers Association of India presented the "Life Time Achievement Award" in 2011, for 'his Distinguished Contribution to Structural Engineering and the Profession of Engineering Consultancy'.
 - Engineering Council of India presented the "EMINENT ENGINEER AWARD 2013" in 'recognition of his significant contribution to the engineering profession of the highest order and service to the society which will inspire engineers for all times to come'.
 - The Governing Council of Structural Engineers World Congress (India) presented the "SEWC (India) Sundaram Medal 2013" for his "Outstanding Services to the Structural Engineers World Congress and in the field of Structural Engineering in India".
 - ARCHI DESIGN Commendation Award for "Best Designed Structural Engineering Project 2013 for Project – Jaisalmer Airport", for a "very Interesting, Creative Concept and Designed Intellectual piece, the project idea representing a new way of thinking and creativity."
 - Hospitality Industry – Architecture - Interior Design-Management Conference + Exposition Honoured "Hi AiM 2014" in 'recognition of his proven contribution to the Hospitality Industry', at New Delhi in March-2014.
 - Association of Consulting Civil Engineers (India) Madurai Centre : Sir M Visvesvaraya Eminent Engineer Award – 2014
 - The Indian Institute of Architects – Honorary Fellowship, Jaipur – May 21, 2017
 - Indian Building Congress (IBC) – Life Time Achievement Award 2017, Patna 28th December 2018.

BOOKS AND PAPERS

Er. Mahendra Raj has authored and presented, in various seminars and workshops, a number of papers related to technical and professional issues (see http://www.mrc.co.in/cp_5.html for a list of these papers).



The book *The Structure-Works of Mahendra Raj*, Park Books, 2016, 428 pp. (by Vandini Mehta, Rohit Raj Mehndiratta, and Huber, A.), features twenty-eight of Er. Mahendra Raj's buildings in detail through rich photographs and color reproductions of archival plans.

PROFESSIONAL AFFILIATIONS

Er. Mahendra Raj is a fellow/member of several national and International professional bodies and took active part in many of them:

- Fellow - The Institution of Engineers (India)
- Member - American Society of Civil Engineers

- Member - American Concrete Institute
- Member - Prestressed Concrete Institute
- Member - Indian Road Congress
- Member - Earthquake Engineering Research Institute
- Fellow - Consulting Engineers Association of India (Past President)
- Fellow - Indian Concrete Institute (Past President)
- Member - Consultancy Development Centre (Past Vice Chairman)
- Member - Indian National Group of the International Association of Bridge & Structural Engineering
- Member - International Association for Shell and Spatial Structures
- Fellow - Institute of Architect

EPILOGUE

Er. Mahendra Raj married Ms Shukla Dutta in 1970. Shukla was an MBA from Harvard and was selected in the States to return to India and teach at the Institute of Management, Ahmedabad. Later she was a Senior Executive in an Advertising Agency in Mumbai. In 1969 she moved to Delhi as Branch Manager of an advertising firm "Marketing and Advertising".

Mahendra Raj has three children, two sons and one daughter. His eldest son Shomik Raj is a Ph.D. in Civil Engineering from Berkley and is working for World Bank. He resides in Washington D.C. and is married to Renu Pavate, an Architect. They have a son and a daughter.

Their daughter is an LLB from India and has recently acquired the degree of "International MBA (Hons.)". She resides in Paris with her husband, Dr. Chetan Chitnis, who is a brilliant Scientist and working at Pasteur Institute in Paris. They have two daughters studying in Paris.

Their youngest son Rohit Raj is an Architect who graduated from CEPT Ahmedabad and got his

Masters from M.I.T., Cambridge, USA. He is married to Vandini Mehta, who is also an Architect from CEPT with a Masters from Berkley. They have a daughter and live in Delhi.

Er. Raj lost his wife Shukla in 2011. He still attends to his office, and live in Delhi with his younger son.

References:

<http://www.mrc.co.in/cp.html>

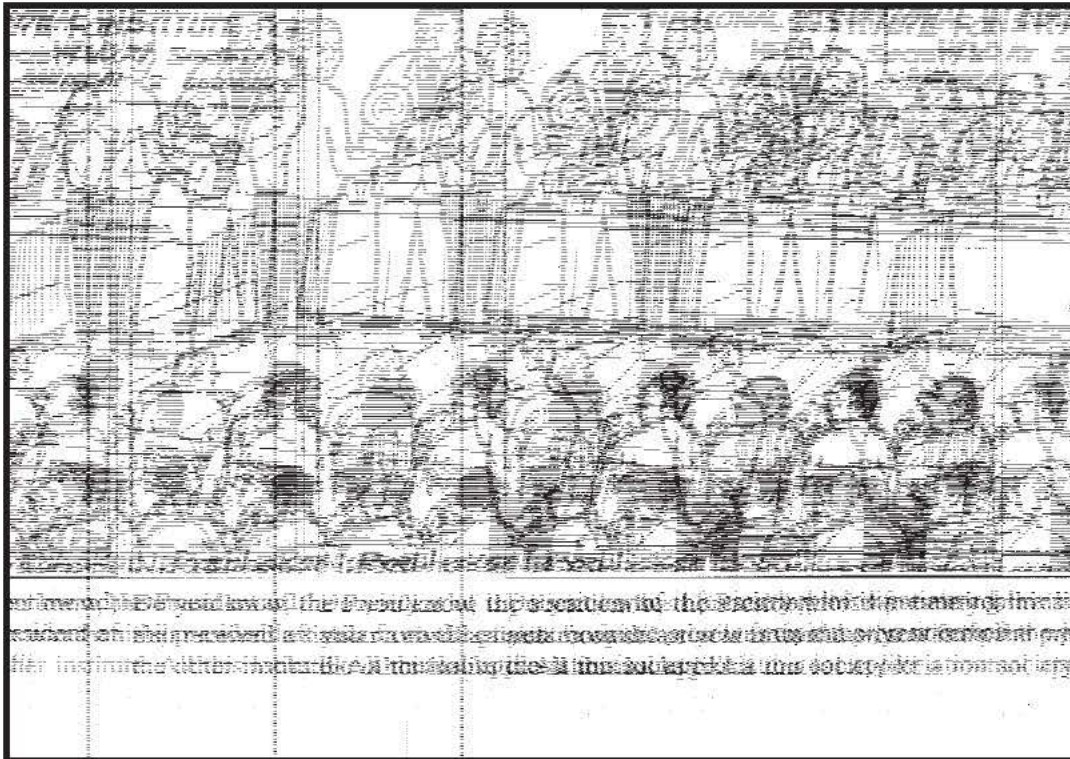
Author



Dr. N. Subramanian

Dr. N. Subramanian is an award winning Author, Structural Engineering consultant and Mentor, currently based at Maryland, USA, with over 45 years of experience in Industry (including consultancy, research and teaching). He was awarded with a 'Life Time Achievement Award' by the Indian Concrete Institute and many other awards for his contributions towards Structural Engineering. He is the author of 26 books, including the famous books on 'Design of Steel Structures', 'Design of RC Structures' and 'Principles of Space Structures' and the recent Building Materials, Testing and Sustainability. (email - drnsmani@yahoo.com)

Believe it or not



Do you know, the President of the society who is presenting this life time achievement award, also received a similar award last year from the present recipient who was then the president of the other institute. All this looks like a mutual appreciation society!!!

Courtesy Indian Concrete Journal

TRIBUTE TO OUR GREAT CIVIL ENGINEERS

In a short span of three months we lost three great civil engineers in Mumbai.

Prof. M. D. Mulay (18 April 2020) past President ISSE
Prof. G. B. Chaudhari(6 May2020) past President ISSE
Er. J. J. Shah(14 May2020)

They will be remembered for their outstanding contribution to Civil Engineering and to ISSE. May the departed soul attain moksha !Editor and Team ISSE.

“SIMPLICITY WITH EXTRAORDINARY QUALITIES!” TRIBUTE TO RESPECTED PROF. M. D. MULAY



(1935-2020)

I cannot think of any other words to describe Prof. M. D. Mulay. Shall I call him Legend of Structural Engineering or Dedicated Professor or Source of Everlasting Enthusiasm or Friend of Everybody?

He was born in Burma (Now Myanmar) in 1935 and his family shifted to India, when he was only of Five years. With exceptional scholastic skills, he passed B. E. (Civil) in 1959 and also M. E. (Structural) both from V. J. T. I., and that too with all family responsibilities.

He joined as Faculty in Structural Engineering Department of V.J.T.I. in 1962 and retired as Professor in 1995. He was a true teacher, who could teach any subject well both to Under Graduate as well as Post Graduate Students. His simplicity always made his presence dignified and his knowledge reflected a true Academician. He was very passionate about teaching and has nurtured Several Students and Younger members of the Faculty into Successful Professional Practitioners. He was normally available in Institute up to 8 p. m. and taking summer Vacation only for a Week. At any time when someone used to go to his cabin, he was putting put his work aside and attended that person.

He did not stop limiting himself as in Text Book knowledge, but actively involved in Live Projects throughout his Professional Career. He was involved in the team of Structural Consultants for Bandra – Worli Sea Link, Wankhede Stadium, Mumbai Chhatrapati Shivaji Maharaj Airport Terminal, CIDCO Bhavan etc. He also took active interest in activities of Institution of Engineers (India) and worked in organizing committee for National Seminars and Workshops. He was a Friend, Philosopher and Guide to many budding

professionals, including me.

In order to dedicate his knowledge to Practicing Structural Consultants and Solving their Common Problems, he joined Indian Society of Structural Engineers (ISSE) as Advisory Trustee during his service at V.J.T.I. and then became President of ISSE for Three Years; and thereby imparted his Efficiency with Extreme Sincerity to Professional Brothers & Sisters in the field of Structural Engineering.

We know that a Professor can Retire, but Not an Engineer. He was active in his Professional Practice up to the Age of 81; and then preferred to take rest at home. Finally he went to God at the Age of over 84 years on 18th April 2020.

Truly a Self made person with Good heart and Never Forgotten Smile; and thereby radiating his extraordinary personality that made everyone love and will respect and cherish him now and always.....! He left behind his wife, two sons and one daughter. All children are well settled. Praying Almighty God for giving Peace to the Departed Soul and Strength to Family Members.

----- by Javahar R. Raval
Advisory Trustee, ISSE

PROFESSOR G. B. CHAUDHARI ----- A KARMAYOGI



What everybody knew was he was a graduate from Walchand College of Engineering, Post graduate from IIT Mumbai (M Tech Geotech), Professor and Head at VJTI Structural Engineering Department, member of high rise committee

Mumbai, Past President of ISSE, helped many students in their dissertation and to achieve greater heights and the list goes on.

But many did not know that he was in a real sense a Karmayogi. He worked till he breathed last. He was a man with zero ego , down to earth personality. He was so humble and great that many took him for granted. He used to call his students with respect .

He knew his subject very well and he kept his fellow engineers and clients at ZERO STRESS LEVEL. He was an Engineer who could feel structure. He had practical solution almost for all the problems and that too at minimum of costing. His daring approach and out of the box approach stunned many civil engineering experts. Usually we engineers are embedded with crab mentality. On the slightest opportunity we are ready to tear

apart the concept, design of fellow engineer. He always defended Engineers. He defended successfully engineers in enquiry committee.

He was famous for his Wedge Shear theory with which he stabilized the soil and increased the soil bearing capacity. He helped the economy thus by replacing Pile foundations with Open foundation. Many learned Engineers could not digest this concept because of our slave mentality to West. There is no such theory propagated by Western Author. On his theory thousands of building have been successfully constructed . Now On us lies the onus to make his theory fit in Soil/Structure criteria. If we cannot fit in it is We who have failed because his technique stood with time. May one of us can get his Wedge Shear theory gain status in name of Chaudhari theory vis a vis Terzaghi.

He will always be remembered for his humility, daring approach, out of box solution, keeping people and structure both at ZERO STRESS LEVEL, a true teacher and a great Karmayogi. We all are blessed to have him as our GURU.

-----Team ISSE

ER. JAYAKUMAR SHAH - CIVIL ENGINEER WITH PASSION FOR DURABILITY



Er. Jayakumar Shah was known as Durability consultant - J J Shah in civil engineering circles. He will be remembered for his passion to interact with civil engineers on various construction aspects, repairs and durability of structures. He

conducted more than 25 workshops on repairs and waterproofing at Institution of Engineers Maharashtra State Centre. He had written books on "Repairs" , "Lessons not learned from failures"

and written articles on many important civil engineering subjects. He is known for Shah Plaster which he promoted with addition of fly ash to improve the durability. He worked as durability consultant after his retirement from Hindustan Construction company after long service. He will be remembered for his outstanding contributions.

--- Team ISSE.

USE FERROCEMENT AND SAVE THE EARTH... WHICH IS ONLY ONE WE HAVE!!

By Milind Kulkarni

It is observed that both in traditional and modern constructions, natural resources are used directly as well as indirectly.

For example in stone, brick and mud constructions in rural areas quarried stone is used and the mud in the form of clay /clay blocks is used. All of this leads to depletion of natural resources.

In case of modern constructions of course huge consumption of natural stone such as basalt, for aggregates, river sands, cements and steel is used for the basic frame work of the structures. There is huge depletion of these natural resources which are not renewable.

In modern constructions there is still more abuse as there is rampant large scale use of glass, aluminum, PVC, HDPE, stainless steel heating and cooling systems, all which have a very high embodied energy making them power guzzlers for their manufacture and difficult for recycle and reuse and even maintain.

Also most importantly the top soil which is the most important layer for agriculture gets sacrificed. Not many architects, structural engineers and also sometimes few landscape experts do not know its importance, except the farmers who very well understand the real importance of loss of top soil as their livelihood is dependent on it.

The cost to benefit ratio, or the price we pay as individuals, corporates, society and the country at large is very high as the cost to benefit ratios are very skewed in the long term. Many know of it, many don't, but most of the professionals fall into the lure and trap of survival and success and prescribe it to many unsuspecting clients!

In such a scenario which is commonly seen and spread across the entire construction industry, "Ferrocement Technology" based

construction comes as a wisp of fresh air and gives some hope and respite from the onslaught of rampant depletion of natural resources.

Ferrocement construction



Sadly the technology (though very old) is not known fully or the latest advances are not known hence completely neglected by architects and structural designers who have apprehensions for its use in heavy duty requirements. The lack of a Code of Practice and a commentary further highlights the problem.

The Ferrocement Society of India is working on both the above impediments. It takes workshops, lectures, training programs, publishes booklets, offers consultancy services for planning design and construction of those are keen.

Further the NBC fortunately does take note of the technology and its importance and has allowed for its use subject to certain conditions.

Also the Ferrocement Society along with professional experts in the field, Governmental such as MERI of Maharashtra, NBMCO are working under a committee 2P9 CED 52 to prepare the first ever draft code for the BIS and work is in its advanced stages. For a change India

is much much ahead of most of the countries in terms of formulating the code on a rational basis with strong design principles and fundamentals

Eco-friendly, cost competitive, lower life cycle costs, use of local semi-skilled labor construction using Ferrocement technology reduces the depletion of natural resources to quite some extent. It's a great green initiative simply because of primarily lesser material consumption. Calculations done on live examples have also proven, a lower carbon foot print and sustainable green credit ratings.

Firstly it does not have hard aggregate (metal), and bricks as an ingredient at all. Secondly it has weld meshes and chicken meshes as the main reinforcement, which requires lesser energy for manufacture. Cements containing high fly ash content, or GGBS can also be used. Sand can be natural or manufacture, both are suitable.

The tor steel usage is very limited and used more as a skeletal steel which offsets the need for formwork and precious timber, and steel and again structural steel used for formwork of modern RCC structures is majorly eliminated. Scaffolding is also nominal and much less than what it is used for in RCC and PSC works.

And most importantly the thickness of the Ferrocement being very low the consumption of cement, sand, (even manufactured sand can be used!!) gets reduced.

Today with the advent of Geopolymers in construction it is possible to have Ferro Geopolymer based construction. It has the greatest advantage of replacing cement and sand by 100%.

Fly Ash which is an environmental burden and a challenge for the safe disposal is used be used for making Geopolymers and activated using simple chemicals and made to behave like cement!

Geopolymers only requires sunlight (which is abundant in this country for almost 9 months of the year!) and a temperature of about 30 to 35C for curing and most importantly completely eliminates the need for water for curing which is the most precious thing on this earth today.

Ferro-geopolymers could be the game changer technology for the future and the time is not far off as some structures have been built and their performance for strength, and durability is very encouraging!

Further from the material properties point of view most importantly the behavior of Ferrocement as a2 phase, homogenous composite as against concrete which acts a heterogeneous composite makes ferrocement far more superior than RCC.

Hence its must be noted that ferrocement is not a derivative or a type of concrete and has its own unique engineering properties completely different from RCC and PSC. The closest it can come to or be analogous to is structural steel

Its ability to take both high tensile and compressive stresses almost equally, at very low crack widths the need and use of very thin sections, thus reducing the self-weight, (as a consequence lesser attraction of earth quake loads), elimination of formwork and scaffolding, resistance to shrinkage and drying cracking both short term and long terms makes it a technology of choice for architects and structural designers.

I am sure with all the above attractive introduction all of you would be keen to know more of it. Let me make it simple in the first introduction!

Ferrocement is nothing but a combination of cement, sand, weld mesh, chicken mesh pressed and filled with mortar. Skeletal steel in the form of 6mm/8mm bars are used for achieving form and shape to eliminate the use of formwork.

"A little change in the type and pattern of the reinforcement, the use of fine wire meshes instead of large diameter bars, and press filling mortar either by hand, machines, or precasting makes it a wonder material!!!"

This is how Dr Prof Divekar a pioneer, visionary, has explained it simply after living with it in body, mind and soul for the past more than 40 years and having designed and constructed a large number of structures successfully

Normally while constructing we use bricks, steel, metal, stone, timber etc, and sheets for roofing. But now we have to reduce quantity or eliminate them. Here we are looking at the workable option of using three materials, cement, reinforcing steel GI weld meshes and GI Chicken meshes and sand

Ferrocement dome :



Firstly let's understand chicken meshes. It is a hexagonal wire woven GI mesh that's flexible and can be and needs to be stretched while fixing it to skeletal steel. Many combinations are available in the market but one of the most commonly used size is 12 x 12 x 24g(0.62mm) hexagonal chicken mesh. It is generally in layers (minimum 2) as per the design. The number 12 indicates the opening size grid.

A weld mesh is a square grid of small diameter bars prewelded in a factory. It is more rigid. It also comes in many sizes but 75 x 75 12g or 100 x 100 x 12 g are more common and widely used. Here 75/100 indicates again the opening size grid. Weld meshes have square grids.

The skeletal steel is nothing but a skeleton of 6/8mm mm diameter steel bar which can be mild steel, torsteel, epoxy coated, fusion, CRS, welded fabric as the requirement may be. They are fabricated by spot welding to the required shape of the structural element such as beams, columns, slabs, arches, domes, pyramids etc.

Then we fix the weld meshes of required shape, size number of layers to the reinforcing skeletal steel and finally stretch this chicken meshes on

both sides of the skeleton steel

In the second part we prepare a thick cement mortars of fine sand and small quantity of water. The mortars can be design mixed for high strength or by weight/volume as the requirement may be. M30 grade is commonly used.

Finally we take this thick mortar and "press fill it" in the chicken-mesh layers. After the press and fill a final finishing and levelling is done using a plate trowel for aesthetics.

By pressing it becomes stiff and gets bonded to the weld meshes, chicken meshes and skeletal steel. The bond capability and characteristics is what differentiates ferrocement from all others. After some days you see this is just Curing is required just like concrete.

The applications of this technology in the construction industry is enormous and wide ranging. From very small to large structures both cast in situ and precast. Security Cabins, compound walls, buildings big and small domes, pyramids, water tanks, treatment plants,, repairs, waterproofing, permanent forms, check dams, silos, roads, pathways, pontoons, blast fences, ware houses, roads, drains, gutters, cold storages and a lot lot more... !!!

Architectural features include hard landscaping, ponds, benches, flower beds, fins architectural shapes and forms, benches, jogging tracks, single leaf, double leaf partition walls, and many more!!

Small check dam in ferrocement arches:



Ferrocement has been in use for the last 30 years across the country. Everybody is aware of it, but many do not know the details of the technology and costing. It is a simple, straight and easy to build. It is a futuristic material and is an easy solution for many of the problems which concrete even today cannot resolve!!

So let us decide to understand in a bit more detail and adopt this magical thing called as ferrocement technology in the future articles, on this subject which are proposed to be published.

In America, Mexico, England, France, Germany, Indonesia, it is being used extensively for multiple applications but not majorly involving logical and proper structural design philosophies developed here as in India

This small introduction will certainly ignite the curiosity of one and all from clients, architects, structural designers, interior designers, and furniture makers also!!

In the next couple of articles on this subject I will try and make the concepts, basis, philosophies, assumptions and theories more clear and follow it up with some design examples to bring in more clarity.

Author



Milind Kulkarni

Milind Kulkarni is a senior Consulting Engineer from Mumbai having more than 35 years of experience. He can be reached at consultmilind@mkce.co.in

ISSE STUDENT GROUP

At ISSE, we have started an initiative to help connect the Civil Engineering Students and Fresh Graduates with the Construction Industry for a mutually beneficial relationship. The long term objectives of this initiative are:

A] To make the transition of Fresh Graduates from Institute to Industry more meaningful and smoother

B] To make Civil Engineering education industry relevant

This is a monumental task which will require tremendous commitment and sustained effort. But we have already made a modest beginning as follows:

1. Formed a STUDENT HELP GROUP (SHG) on Telegram, which now has 2600 members. Students can join the Group: <https://t.me/issestudent> They can also tell us about their interests and expectations by filling out the form: <https://forms.gle/TDmnUQ5HFBFpq15n6>

2. Organized three INDUSTRY ORIENTATION WEBINARS (IOW) to give students an overview of the different Fields of Construction Industry. More are being planned.

Well, a lot remains to be done for which all of us have to come together and work for this Cause with focus and steadfastness.

We request you to come forward and contribute your time, effort and expertise depending on your interest.

Please write to issestudenthelp@gmail.com with your contact details, your present occupation, area/s of expertise and how you can help.

Let's come together and do our bit for the next generation of Civil Engineers!

Looking forward.

Umesh Dhargalkar

SELF – REDEVELOPMENT OF CO-OPERATIVE HOUSING SOCIETIES – NEED OF THE HOUR

By Siddharth Tipnis

The implications of the “Development Control and Promotion Rules” (DCPR) 2034, under MRTP Act 1966, which were published on the 8th May 2018 with “Excluded Portions” (EP) were brought into force dated the 1st Sept 2018 and are now applicable throughout the Island City, and its Suburbs and Extended Suburban region. It is quite clear from the outcome that sincere efforts and fair amount of planning have gone into these works while framing the rules, keeping in mind the applicability with regards to all types of structures, like Residential, Commercial, Industrial, IT Sector, etc. Even though the perception of a Glass full of Water may not appear whole-fully on a brighter side, one could easily conclude that the Glass seems to be Half Full and not Half Empty.

This should bring in a lot of cheers to the Co-operative Housing Societies that intend to take up the Redevelopment of their society. In the current market scenario wherein nearly 5600 builders have either shut shop or are facing criminal proceeding under various sections of the law, coupled with near about 1,25,000 families thrown out of their houses to fend for themselves and face the suffering due to stoppage of work by these builders, are proving reasons enough to deter societies from going for redevelopment. The dilemma of whether to opt for a builder or not, under these fearful conditions, is creating a roadblock in the minds of the society members. What is the solution? Yes, there is definitely light at the end of the tunnel. Mumbai District Central Co-operative Bank (MDCC) has come to the rescue of societies that are either stuck up and want to complete their project or those who want to redevelop their society with the concept of **Self-Redevelopment**. Self- Redevelopment “**Of the Society, For the Society and By the Society**” is wherein the Society itself acts as the Promoter, Developer and the Builder and executes the project by hiring the services of an expert who is a known as Project Management Consultant (PMC).

Any project requires Funds and these have been assured by the MDCC Bank, in the form of a loan amount equivalent to 95% of the total project cost

(5% to be contributed by the members of the society) at a simple rate of interest of 12.5% per annum subject to obtaining the IOD/CC from the concerned authority which in this case will be MHADA. The interest payment has a moratorium period of 2 years and regular payment of the accumulated interest amount over the two years plus the interest per year thereafter. The payback period for the entire loan amount is 7 years for loan amount less than or equal to 50 crores and 10 years for that above 50 crores. It would be in the fitness of things for all such societies opting for Self-Redevelopment to know the advantages of Self-Redevelopment over the one by the builder, as the advantages are truly manifold. Few of the many salient features are mentioned below: like:

- 1) The society is the builder, developer and owner. The Governing Body(GB) takes the responsibility of the overall project and the Managing Committee, the execution.
- 2) All the documentation is done with the approval of the GB in consultation with Managing Committee and the members
- 3) The society enjoys all the profits that the builder would have otherwise inherited thus getting a healthier corpus fund and, in some cases, extra amount individually.
- 4) Due to 100% availability of project funds the project completion becomes achievable within the given time and financial constraints.
- 5) A much more and larger percentage of carpet area over the existing CA (cases are where society has got almost 60% to 70% over and above the existing carpet area) can be thought of.
- 6) Enough salable portion to take care of the repayment of the Bank loan amount.
- 7) A home with better quality and desired finishes and much more.

The crux of the matter, the Society should understand, is that the Self-redevelopment can be successfully achieved only if all the members behave as “One Family”, keeping all their ambitions, greed and vested interests aside. 100% consent is the key to successful completion of the

project. Self-Redevelopment is not a business but a path to achieve better homes and living conditions for us and our future generations to come. It is a like a dream fulfilled of living in a better and bigger house where there is happiness for all the house-hold members. Self-Redevelopment is like Unity in Diversity that can only be achieved with a strong bond among all those involved. The best part is that the choice of flats/floor for the existing members (by Vaastu / or otherwise) is their choice. The admission of new members is entirely at the discretion of the society and those could be relatives, friends or close acquaintance. Surely this is not possible in a BUILDER oriented development.

Author



Siddharth Tipnis

Views expressed by Project Management Consultant **Siddharth Tipnis**
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KINGFISHER TOWER, BANGALORE – A CASE STUDY

By Sameer Hadker

The majestic Kingfisher Tower located in Bangalore, India has been developed by Prestige Construction and United Breweries to serve as a luxurious residential complex. Architects Thomas Associates and Structural Engineers Sterling Engineering Consultancy led proficient design teams to the completion of this urban edifice.

Client briefs are simple. When it comes to a complete analysis of structural safety, the magnitude of the task at hand can be assessed. It's not the first time we were asked to design a penthouse for a client, but it was the first penthouse we designed that sat atop three tower blocks of thirty-threestorey mega-structures with cantilevered landscaped gardens, an infinity pool, and a helipad!



The entire complex comprises of three twenty seven floor tall residential towers. They share common basements, parking levels and a grand entrance lobby. Two basements and four additional floors above the ground provide parking for the triplet. From the fifth floor begin the residential suits which continue till the thirty-third storey. From the south face of the structure, five distinct levels house recreational floors at five storey. At these levels, the individual towers connect to create a large base plate to provide facilities like swimming pools, landscaped gardens and gymnasiums. The most striking feature of this project is the cantilevered garden

which projects 18 meters beyond the face of the towers on either side. Elegant scissor, scissor shaped inclined struts are designed to support this feature which stands out as a unique feature. The complexities in design started as early as the foundation, but our enthusiastic and every-ready design team at Sterling considered all challenges as opportunities for innovation and learning.

Isolated foundations were designed based on information obtained from the soil investigation reports. An unexpected finding after actual excavation showed a weak layer having reduced safe bearing capacity which led to major revision of the design of foundation under the west tower. The variation of floor plan from parking to residential suits to intermittent recreational floors and subsequently the penthouse resulted in floating of a few columns carrying heavy loads. The southern elevation shows five prominent recreational levels which have restricted beam depths and floating columns. The structure designed as a R.C.C framed structure benefited from the use of Composite Construction in specific large load carrying members. The connecting areas are supported using a metal deck slab spanning between a network of structural steel beams and girders to create a large base for the recreational level. The use of structural steel not only helped in avoiding shuttering but also minimized construction time. Composite construction reduce the cost of the structure as compared to construction in solely R.C.C or Steel and significantly reduced structural member sizes and gave consideration to aesthetics of indoor spaces. Deck sheeting helped avoid formwork for the intermittent floors. Mode of construction was modified in the recreational floors due.

Space constraints in and around the construction site due to surrounding structures and roadways restricted the location of cranes on the south end. Communication between the structural consultant and contractor regarding crane loading, moment calculations and safety was essential to ensure that cranes provided on site were adequate to lift all the members. This structure made use of two

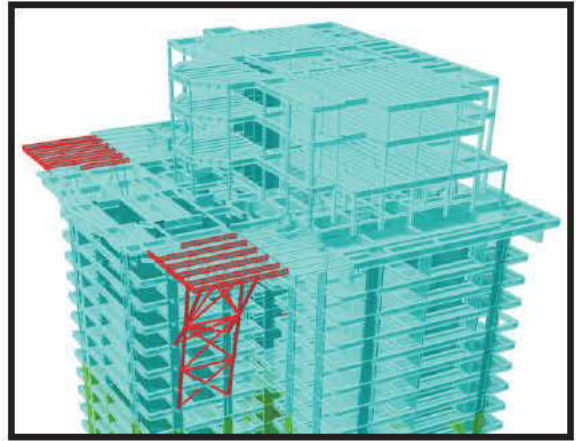
cranes placed on the south side which outstretched their arms to provide support to the northern end during construction of the scissors and cantilevered girders. To provide sufficient stability to the cranes, slabs of two floors under the crane base were supported using props which were removed post-construction. The structure did not require provision of a central core as the framed structure of the towers offered adequate stiffness. Besides, intermittent connections provided at recreational levels helped enhance the



The unique aspect and a design challenge of this structure was to create a large landscaped terrace measuring 4,000 square meters.

An additional transfer level at the 33rd floor was required to support the terrace level which also served as a service floor. As seen in plan, the penthouse cantilevers in three regions, two on the north end carrying landscaped areas and one at the south supporting the penthouse.

The penthouse and the is supported on thirty-three-meter-long and five-meter-deep structural steel trusses which are resting on southern peripheral columns. The void of the truss was utilized for carrying MEP services. Within the penthouse area we have achieved a column free space spanning fifteen meters which is supported on one-meter-deep rib beams skillfully placed to give consideration to aesthetics.



With an eye for aesthetics as well as structural integrity, Sterling Engineering proposed the use of inclined scissor-shaped struts to support the cantilevers at the penthouse. This unique feature as compared to simple-inclined struts makes the structure stand out. As seen in the north elevation a single strut establishes itself from the 27th floor column and splices into two members. This junction uses a steel mechanism embedded into the slab to distribute the loads. Precast R.C.C. brackets were fitted with steel plates for bolted connections to the hollow steel sections of the struts. The splices terminate at the base of the cantilever at the 33rd floor and are fixed using a steel plate and bolt mechanism. Two such identical scissor arrangements under each cantilever along with the help of cross bracings provide lateral stability. Provision of a secondary bolt fitted under the primary bolt ensures safety in case of failure or slip until repairs are carried out.

Sterling Engineering's design team at the head office in Kurla, Mumbai performed all design related calculations and drawing submittals and all site inspection visits and reporting was carried out from Sterling's Bangalore office to ensure fast response to our clients. The project was completed in 2018 and has been a landmark project for the city of Bangalore and all disciplines associated with it.

Author



Sameer Hadker

Sameer Hadker is a junior engineer at Sterling Engineering Consultancy Services Pvt. Ltd., Mumbai. He recently completed his Civil Engineering course and joined his Grandfather's firm.

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NEWS AND EVENTS DURING APR – JUN 2020

by Hemant Vadalkar

Due to Covid-19 pandemic and lock down from 20 March 2020, seminars, workshops in physical form could not be conducted. Online events and meetings were conducted during this period for all the technical activities.

25 Mar 2020 onwards:

P Surya Prakash, Senior Structural Consultant from Hyderabad and founder of Smart Infr-Est conducted Technical lecture series for Civil Engineers on Face Book Live on various civil engineering subjects right from site selection, survey, geotechnical investigation, RCC design, Steel design, Project management services, MEP services, Tendering process, Cost Estimation, Master planning of projects, Ethics in Civil engineering etc. For more information please visit <https://www.facebook.com/smartinfr-est/>

11 April 2020 :

ISSE Webinar on Interpretation of NDT results by Ravi Ranade.

ISSE arranged webinar jointly with Ultratech Cement on the topic of NDT results interpretation by senior consultant from Pune Er. Ravi Ranade. He described various NDT methods and purpose of test, its significance, limitations and precautions during the results interpretation. It was very informative and interesting. More than 500 engineers joined the event.

2 May 2020 :

Post Tension slab design by Prof. Gadgil by Epicons.

Epicons friends of concrete arranged a lecture by Prof. M G Gadgil on post tension slab analysis, design and execution at site. He described various software programs for post tension analysis and design using RAM and SAFE. Punching shear check is critical for flat slabs. Post tensioning can only compensate dead load and partial live load component. For lateral load passive reinforcement needs to be provided and total moment plus shear to be checked at all column locations.

14 May 2020 :

SEFI Revision of IS456 presentation by code committee members Dr. CVR Murthy and others. On behalf of SEFI, Er. Alpa Sheth arranged a webinar on recent draft code of IS456 revision. Dr. CVR Murthy and others elaborated on the amendments in the code.

16 May 2020 :

ICACI Excellence in Concrete Construction Awards.

Indian Chapter of American Concrete Institute invited nominations for awards in various categories. Online award function was conducted by ICACI. Winning entries made project presentation during the event.

16 May 2020 :

ISSE webinar on Tensile Membrane Architecture with Serge Ferrari.

ISSE arranged a webinar on tensile membrane structure with Serge Ferrari. For very elegant light weight covering structures, membranes can be used in different colours and shapes. Various applications of tensile structures from canopies, long span roofs, walk way cover, covering large areas in Mall and exhibition centre were discussed.

19 May 2020 :

PEATA – Interpretation of clauses of DCPR2034 by Adv. Dr. Sathe

PEATA arranged a talk on legal interpretation of various clauses in DCPR2034 for MCGM area. Various clauses and their legal meaning was explained along with the background and legal case references was explained by Adv. Sathe.

23 May 2020 :

IASTRUCTE Panel discussion on IS1893 and IS16700 Dr. CVR Murthy, Alpa Sheth, Girish Dravid. Online panel discussion was arranged on various clauses of IS16700 and IS1893 was arranged. On behalf of practicing structural engineers, Girish Dravid asked questions to experts. Clarification and amendment to some of the clauses is required which can be taken up in the

next revision of code. Regarding code exceeding building as per IS16700, local bodies need to constitute a review panel for approving such cases. But this has not been done in any major city.

30 May 2020 :

Epicons friends of concrete arranged a webinar on "Code exceeding buildings IS1893, IS16700" Dr.Yogendra Singh , HOD, IIT Roorkee explained the code provisions and push over analysis method.

16 June2020 :

ISSE working committee arranged Virtual meeting of civil engineering experts for helping the students of civil engineering. Various options and suggestions from experts were discussed to formulate a group to help young civil engineering students and fresh graduates.

24 June 2020 :

Webinar on NBC2016 : Glazing was addressed by Sanjay Pant of BIS and Dr. Arul from IIT Madras. Dr.Arul explained type of glazing systems used in the building cladding and roofing, design of supporting system and design of glass used in glazing system as per NBC2016 provisions.

24 June 2020 :

ISSE Student Help Group – Inaugural Webinar was conducted by ISSE. Umesh Dhargalkar coordinated the program. Chief Guest Er. N N Shrikhande talked on Role of Civil Engineers and opportunity available for fresh civil engineering graduates.

25 June2020 :

Sandip Polytechnic Nashik and ISSE Webinar on Repairs and maintenance of buildings. Shantilal Jain gave key note address .Senior consulting engineer and repair expert Er. Satish Dhupelia talked on repair and rehabilitation of structures. He discussed about the sensitivity required for repairing heritage structures without damaging the existing stone masonry structure. He also showed the problems of bad material used in RCC structure, bad workmanship, distress in recently constructed RCC structure its cause and remedies. He showed some of his case studies of repair.

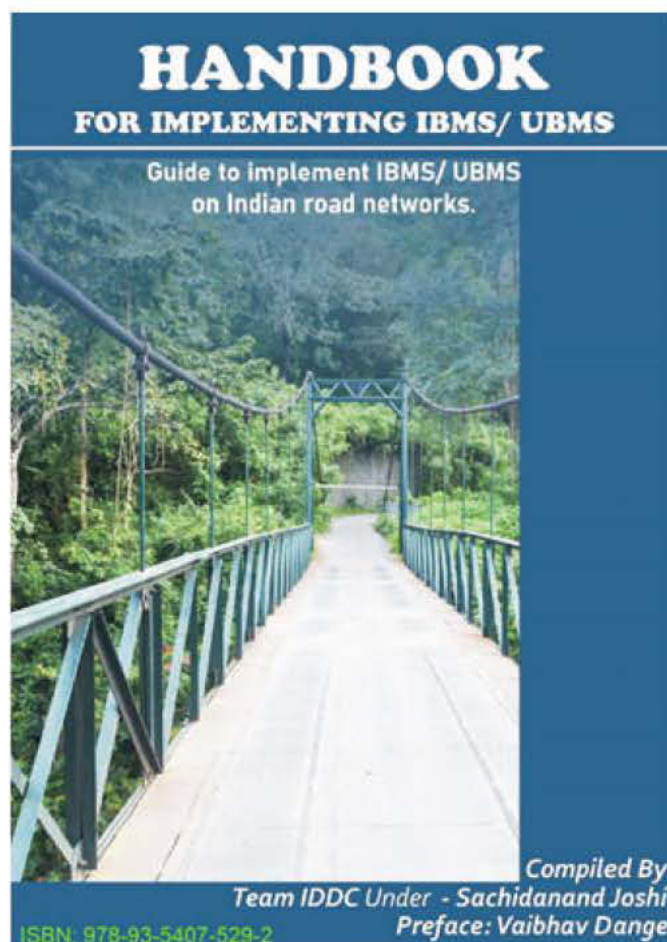
Hemant Vadalkar summed up the discussions and gave concluding remarks. Prof. Prashant Patil coordinated the entire programme.

30 June 2020: ISSE arranged online webinar on Steel Joint design and detailing. Dr. Mahua Chakrabarti former HOD VJTI Structural Engineering Department discussed various type of steel joints and connections. Steel connection design software features were illustrated and showcased by Mr. Seetharam from IDEA Statica.

30 June 2020:

Er. Sachin Joshi who had been working on Bridge management systems had published a manual on Bridge Management System. It can be freely downloaded from

<http://iddcindia.com/ibms/handbook-final/>



In India, Bridge management system was first introduced in 2015, when Indian Bridge Management System (IBMS) was developed by Ministry of Road, Transport and Highways (MORTH) vide a development and implementation

consultant M/s IDDC Engineers Pvt. Ltd. the need to provide safe and structurally sound bridges on the national highways of India, prompted MORTH to take the decision.

Bridges need to provide effective service during its service life which meets the demands on the society and people which are dependent on these bridges. Bridges provide connectivity and ensure smooth transit to goods, people on the national road network. Even after 5 years of introduction of IBMS and after three communiques from Minister urging the state government to adopt IBMS, not a single state government has been successful in doing so. The difficulties and hurdles faced by the departments are related to unclear method of adopting such a system. This handbook is an effort to assuage these obstacles. Often Bridge Management is mistaken as Bridge Maintenance or Bridge information system (BIS). Maintenance is dictated by absurd budgetary provisions which are insufficient to even paint the bridge.

These provisions do not consider the requirement of the engineer to address the risks to safety and the need to provide efficient service during the maintenance and operations period of the bridge. Recent introduction of Concessionaires' to build, operate and transfer (BOT), Built, Operate, Lease Transfer (BOLT) and Toll, Operate, Transfer (TOT) the road network has resulted in an urgent need to create a system that addresses the necessity to have a cost-efficient life cycle for bridges and other infrastructure on the road network. Bridge Management System fully satisfy these objectives and provide data that can be utilized for many other technical and financial goals of managing the infrastructure. Bridge Management caters to cradle to graveyard needs of the bridge. BIS and maintenance are two essential components of Bridge Management. BIS is generally the starting point of defining the bridge asset and maintenance is required to ensure that this bridge performs to the level of efficiency and ensure the safety of the bridge during its service life. Bridge Management provides for management objectives of the network rather than maintenance of bridges. It provides decision making matrix as to what type of bridge is required in the first place and till how long it has to maintained before being replaced by another bridge. (Birth to death – the entire life span of bridge).

The handbook is focused on the above aspects of Bridge management and dwells to address the hurdles faced by state government departments and local municipal authorities to implement IBMS. Chapter 1 deals with need for such a handbook. Chapter 2 is a concise summary of Indian Bridge Management System to bring clarity to the user of the handbook about the subject matter. Chapter 3 dwells on the aspects of Bridge Management as a tool to ensure due diligence and to increase the efficiency of the department in managing the Bridges. Chapter 4 addresses the approach to procurement of services to implement IBMS.

ISSE members are requested to update their contact details like address, telephone number and email so that you will receive the communication from ISSE. You can join ISSE group available for its registered members. ISSE is working on conducting training programme for fresh civil engineering graduates. All senior members are requested to participate in this activity by sharing your experience and case studies. ISSE youtube channel and Face book page links are available at ISSE home page www.isse.org.in

BIS codes are available free of cost
www.bis.gov.in

Bureau of Indian Standards has come out with various code revisions and new codes. Now, all the codes are available free of cost to all. You have to register on BIS site and then the code soft copy can be downloaded. Kindly take a note and utilize this facility provided by BIS.

NATIONAL LEVEL FORUM FOR CIVIL ENGINEERS

A group of civil engineering associations have joined hands for a common objective. The office bearers from associations like IEI, ICI, IIBE, ACCEI, CEAI, IAStructE, IGS, ISSE-Maharashtra, ICE, PSI, GRACEICACI, FACEAT-Tamilnadu, WALTP- Andhra Pradesh, CEVI-Punjab, APGCE- UP, FORCE- Kerala are coming together. Er. P Surya Prakash (SIE, President) is trying to coordinate among the organizations and for the welfare of civil engineers. To make united efforts and discuss way forward weekly web meetings of all the representatives have been arranged for last couple of months.

All civil engineers who are in profession, private jobs, government departments, academics are requested to join this all India forum.

The goals of this forum are,

- ◆ To Protect rights of Civil Engineers,
- ◆ To ascertain uniform competence in all Urban Local Bodies as per NBC 2016,
- ◆ To push enactment of ENGINEERS BILL,
- ◆ To have common licence for engineer's state wise not as per current practice licence Corporation wise.

If we engineers are united and focus on common objective then we can achieve our goal.

The idea is to connect with all civil engineers in India to strengthen our fraternity and resolve our issues.

1. Students & freshers group
2. Academics and research group
3. Government engineers
4. Private employed and practising professionals

We have to form Indian **Professional Engineers Council** with rightful representation of civil engineers.

On the other hand architects are trying to amend the act by taking entire scope of construction in to their fold. We have to resist it.

Associations of engineers to form the **federation state wise** and to submit memorandums to MPs ministers and urban local bodies to empower and engage engineers in every construction project.

Er. Surya prakash requested all Presidents of different associations to submit memorandums to MPs ministers and urban local bodies to empower and engage engineers in every construction project.

LET'S ALL MAKE EFFORTS TO ACHIEVE IT.

Link to join the All India Civil Engineers group on telegram is

<https://t.me/joinchat/RfWqxsxzbIX2nIKnnx1Oxjg>

Those associations who want to send memorandum to ULP, commissioner, MP, MLA, Minister regarding Engineers' bill & Change in use of nomenclature from 'Architect' to 'Consultants' in advertisement of Notice Inviting Tenders (NIT), the draft letters are can be download from our website www.isse.org.in

For more information you may contact the coordinator Er. P Surya Prakash suryapp@yahoo.com



Engineers Open Forum
Webinar on Connecting Engineers Associations in All States
Date & Time : 19-07-2020 Sunday 04:00 PM
ZOOM Meeting ID : 870 3723 9342 Password : engineers (or) 756330348

Presidents ✓

IEI	SIE	ICI & IIBE	IAStructE	IGS
FACEAT	CEAI	ISSE	ICE	PSI
GRACE	APGCE	WALTP AP	CoE	FORCE
CEV	SEAT			

Note: If unable to attend to login in zoom, you may watch with our facebook page <https://www.facebook.com/smartinfr-est/> for live streaming.

Edited and published by Hemant Vadalkar for ISSE, C/o S G Dharmadhikari, 24, Pandit Niwas, 3rd floor S K Bole Marg, Dadar (W), Mumbai 400 028. Tel 022-2431 4423. e-mail issehq@hotmail.com Web : www.isse.org.in for private circulation and printed by S. L. Bengali, 15, Pandit Niwas, S K Bole Road, Dadar, Mumbai 400 028.



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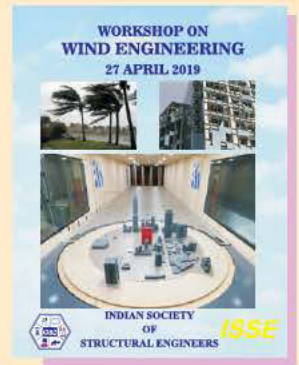
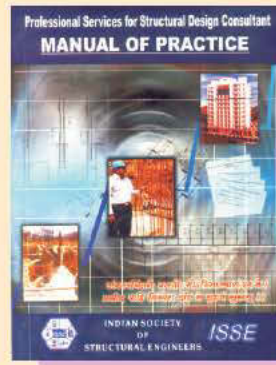
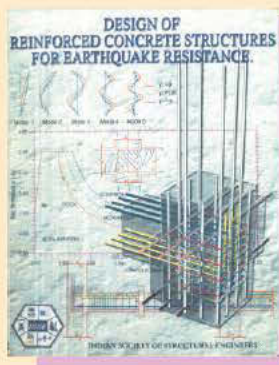
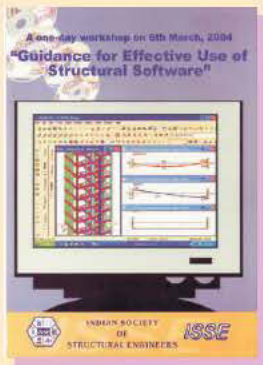
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Hemant Vadalkar felicitating Dr. K Suresh Kumar



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