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OF

STRUCTURAL ENGINEERS

ISSE

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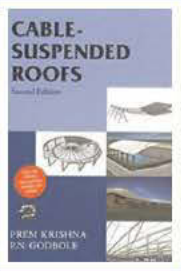
JULY - AUG - SEPT 2020



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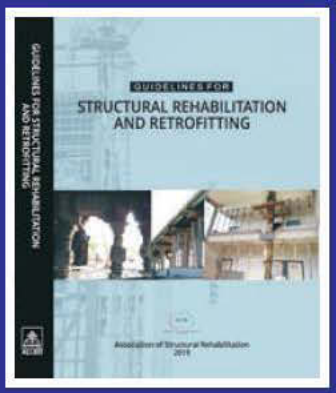

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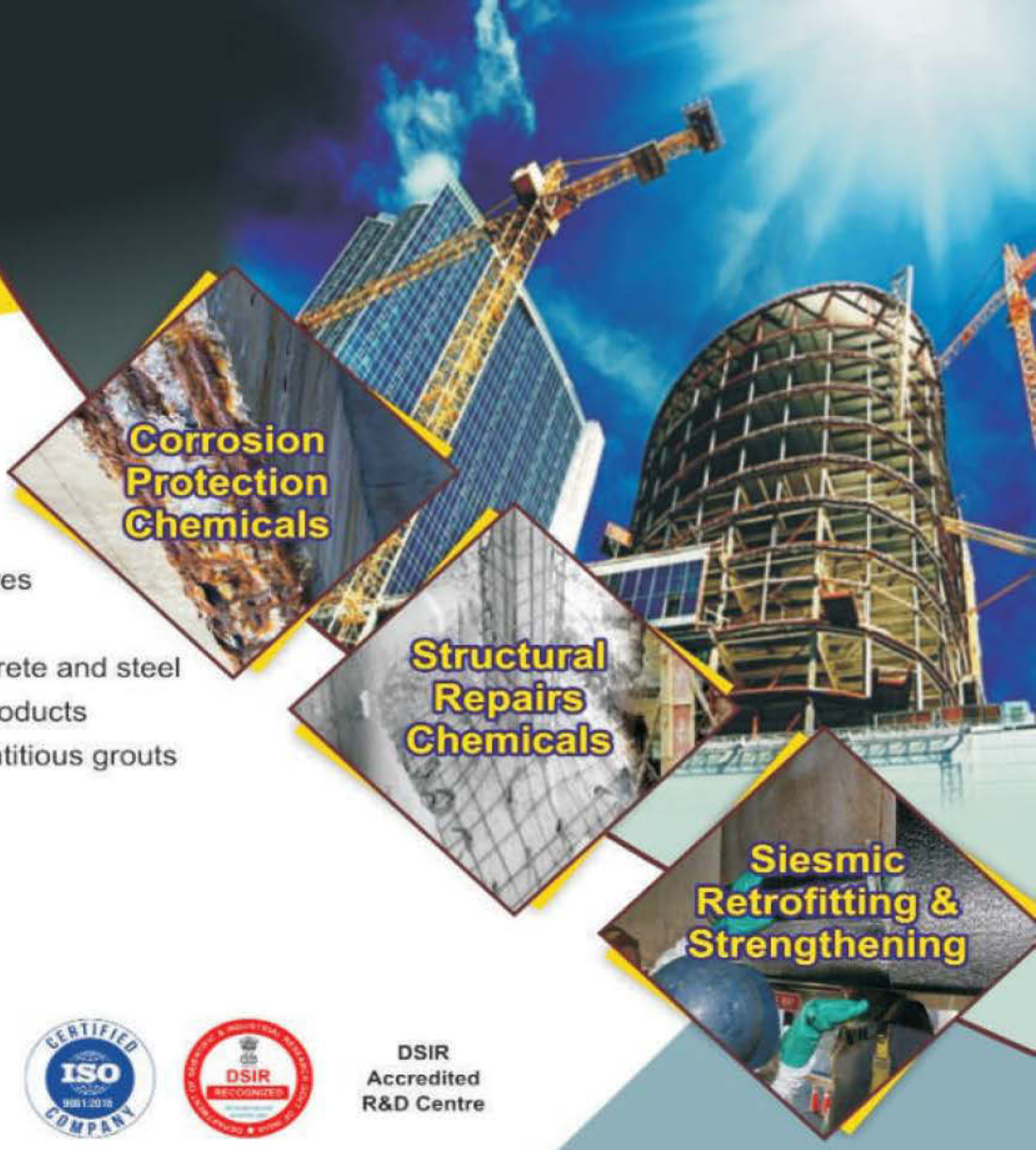

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STRUCTURAL ENGINEERS

INDIAN SOCIETY OF STRUCTURAL ENGINEERS

ISSE

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Editor : Hemant Vadalkar

AIMS & OBJECTIVES OF ISSE

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.

FIELD OF INTEREST

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

Fraternity News

WELCOME TO NEW MEMBERS

(JULY-AUG-SEPT 2020)

01 M	1862	Rahul Rajiv Sarnikar	27 M	1888	Mahendra Dayalsingh Rawat
02 M	1863	Rajeevan B.	28 M	1889	Amit Pundalikrao Mahajan
03 M	1864	Atulya Kumar Singh	29 M	1890	Vinu Clibert
04 M	1865	Yagnik Sureshbhai Makwana	30 M	1891	Dinesh Babu Nagwekar
05 M	1866	M. Kalaiselvi	31 M	1892	Mahendra Edward
06 M	1867	Pawan Kumar Mishra	32 M	1893	Sagar Rajaram Kadam
07 M	1868	Amol Shivram Utekar	33 M	1894	Marriappan S.
08 M	1869	Prashant Soni	34 M	1895	Sabu Scaria Kanjuparampil
09 M	1870	Nikhil Ashok Jadhav	35 M	1896	Danish Ali Furniturewala
10 M	1871	Ninad Ashok Jadhav	36 M	1897	Satish Pandurang Shinde
11 M	1872	Manish Kirit Sheth	37 M	1898	Gayatri Sanjay Bagade
12 M	1873	Rohan Krishna Sadela	38 M	1899	Vishal Jadavji Thakkar
13 M	1874	Vivek Madhukar Shete	39 M	1900	Bhushan vijay Thakkar
14 M	1875	Arul Kumar B. Salem	40 M	1901	Manojkumar Moorthy
15 M	1876	Pragnya Ashish Chopra	41 M	1902	Nikhil Narsibhai Patel
16 M	1877	Neel Mani Sharma	42 M	1903	Vishal Suresh Patil
17 M	1878	Kamlesh Vitthal Khot	43 M	1904	Sandeep Pandurang Bhosle
18 M	1879	Mohammed Umar Usmani	44 M	1905	Ashwin Anil Bora
19 M	1880	Prashant Subhash Hadkar	45 M	1906	Gufran Ahmed Mohammed gaus Khan
20 M	1881	Salil Manohar Gadgil	46 M	1907	Shrinivas Ramulu Karnam
21 M	1882	Mohammed Nadeem	47 M	JM 53	Mohammed Mustafa S H
22 M	1883	Divyajit Das	48 M	JM 54	Ashok Kumar
23 M	1884	Sanjay Shyamsunder Narang	49 M	JM 55	Mohammed Umar Bhati
24 M	1885	Suyog Vasantrao Tikle	50 M	OM 30	Vagmi Engineering Consultants
25 M	1886	Milind Suresh Meher	51 M	OM 31	Skelton Consultants Pvt Ltd
26 M	1887	Nilesh Gurunath Bhoir			

Patrons : 38 | Organisation Members : 31 | Sponsor : 8

Members : 1907 | Junior Members : 55 | IM : 02

Student Members : 224

TOTAL STRENGTH : 2,265

GEM 25 PROF. PREM KRISHNA – EXPERT IN WIND ENGINEERING AND CABLE STRUCTURES

by Dr. N. Subramanian

Prof. Prem Krishna (b.1938)

Son of the illustrious father Prof. Jai Krishna, Prem Krishna earned his B.E. (Civil) degree from University of Roorkee (now Indian Institute of Technology, Roorkee) in 1959, followed by M.E. (Structures) degree in 1961. He received his Ph.D. degree from the Imperial College, London in 1964. Dr. Prem Krishna joined the University of Roorkee as a member of the faculty of Civil Engineering in 1965, rose to become a Professor in 1974 and formally retired in 1998, but continued his association with the university for several subsequent years.

Other assignments undertaken by him include Visiting Asst. Professor, University of Illinois, Urbana, USA, 1968-69; Faculty member in Structural Engineering at the Imperial College, London, 1969-70; Advisor to RITES, 1999-2000; and Railway Chair Professor of Bridge Engineering, IIT Roorkee, 2000-2003.

His areas of expertise include design of steel structures, long span cable supported bridge and roof structures, wind engineering, disaster mitigation. He continues to serve, both professionally, as well as an advisor on several large engineering projects of National importance. Dr. Prem Krishna has also been contributing regularly through his writings on subjects of general professional concerns.

EARLY YEARS & EDUCATION

Dr.Prem Krishna grew up on the campus of the Thomason College of Engineering at Roorkee, and some of his early education was obtained from a Public School at Nainital from 1948 to 1952, and, another public school run by Irish missionaries at Mussoorie from 1952 to 1954.

Admission to the University of Roorkee even in those early years was difficult, though not as tough as today. Therefore, his admission to the Civil Engineering degree programme in the year 1956 was an achievement, and, a matter of encouragement for him. It thrust him forward to fulfill an ambition, he had begun to harbor, growing up on the campus of the famed Thomason College, to become a Civil Engineer. Having obtained the Bachelor of Engineering (Civil) degree in 1959, he had a stint as a graduate trainee at the Bridge & Roof Co. in Howrah (Kolkata) for a year. The B&R Co. specialized in design and fabrication of industrial steel structures. From there he returned to the University of Roorkee for pursuing a Masters course in Structural Engineering. The next very significant turning point in his career that followed was his admission to the postgraduate programme at the Imperial College of Science & Technology, London (affiliated to the University of London), with the objective of getting a doctoral degree. Before, pursuing the doctoral programme in July 1962, he worked for a short period with Flint &Niell, a well- known firm of Structural engineering consultants in London. He then went on to obtain his doctoral degree in November 1964 on the topic *"Analysis of Funicular Suspension Systems"*,

related to the subject area of Cable Supported Structures.

The aforesaid education and training, at some of the best places in structural engineering academics and research, prepared him well for his career. He returned to India to join the faculty of Civil Engineering as a Reader at the University of Roorkee, from 1965.

Prem Krishna, as student of 2nd year BE (Civil) Programme at the University of Roorkee, 1957

AT THE UNIVERSITY OF ROORKEE

Teaching was Prem Krishna's major interest and commitment as a member of the faculty of Civil Engineering. However, he applied himself in no less a measure to research, development and industrial work. He was also involved in the community life of the campus, particularly in games and sports. He was promoted to the rank of Professor in 1974. Dr. Krishna served as the Head of the department from 1984 to 1987, and as Dean Industrial Liaison of the University from 1987 to 1990. He retired from the University service in 1998, to commence his second Professional innings. His students, spread all over the world, recall him fondly, and he considers this as his greatest wealth.

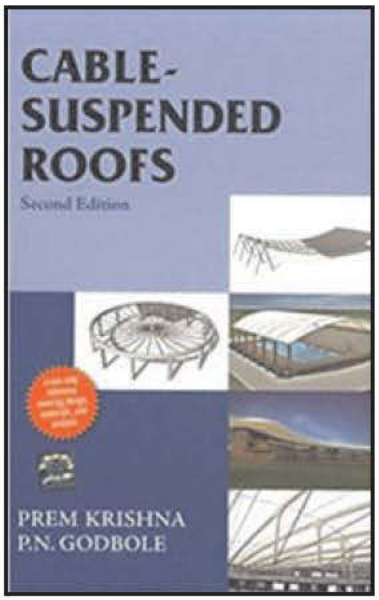
CONTRIBUTIONS IN CABLE STRUCTURES

Application of steel cable ropes or strands for supporting roof structures of large spans was in infancy during 1960s. Comparatively little was known about their analysis and behavior under different loads. Thus, the doctoral work by Dr. Krishna, did provide invaluable breakthroughs. This, and the work done by him in the following years at Roorkee and at the University of Illinois, Urbana, primarily formed the basis of a book authored by him. This book entitled, *Cable Suspended Roofs* was published by *McGraw -Hill* Book Company at New York, in 1978, and, was the first of its kind internationally. The second edition of the book, largely revised and co-authored by his former student and a long-time associate, late Dr. P. N. Godbole, was published in 2013 by McGraw - Hill Education,in India.

Whereas, Dr.Prem Krishna, continued his interest in the subject of Cable roofs, the focus of his work from the 1970s also covered Cable Stayed Bridges, whose potential for application was increasingly catching the attention of Indian Engineers. Besides R&D work in the subject area, he designed the first cable stayed bridges in the country and provided advice or proof consultancy for a number of other such bridges. The pedestrian bridge designed by him as a crossing over the Ganges Canal was completed in 1982 and was the first of its kind in India. Another first for India was a cable stayed road bridge over the Ganges channel at Hardwar, designed by Dr. Krishna and two of his colleagues at Roorkee, and, opened to traffic in 1988. He also was involved in studies or consultancy for several other cable stayed bridges in India, namely, the *Vidyasagar Setu* over the river Hooghly at Kolkata, *Krishnarajapuram* road-over-rail bridge at Bangaluru, *Naini* road bridge over the river Yamuna at Allahabad, road-over-rail bridges at Patna and Burdhman, *Santara market* Road Bridge at Nagpur, and, so on. Besides this, there has been substantial development of large suspended fabric roofs in the country over the last 2-3 decades, which falls within the area of interest

and expertise of Dr. Krishna, as a natural consequence from his work on *Cable Suspended Roofs*.

The work on cable structures, which are inherently flexible and for which wind loading is one of the primary design considerations, brought the subject of wind engineering into focus for Prem Krishna. Furthermore, the occurrence of the horrendous Andhra Cyclone of 1977 and the March 1978 Delhi Tornado, spurred him on to work for the development in the area of Wind Engineering.



Second edition of Cable-Suspended Roofs, published by McGraw-Hill Education, 2013 (First edition was published by McGraw-Hill, New York in 1978)

The First Cable Stayed Road Bridge in India, 1988. designed by Dr. Prem Krishna.

CONTRIBUTIONS IN WIND ENGINEERING

Prof. Krishna established a large Boundary Layer Wind Tunnel in 1982 at the University of Roorkee, which was first of its type and size in India. This facility served the purpose of research and industrial work most actively. As comparatively beginners in Wind Engineering, it was considered essential that Indian scientists and engineers should have the opportunity to share their work and ideas amongst themselves, and also be exposed to expertise elsewhere. To ensure it, Dr. Prem Krishna mooted the idea of setting up the Indian Society for Wind Engineering, which was registered in 1993, and served as its founder president during 1993-2000.

He also endeavored to organize three International events in India. First, the Asia-Pacific Symposium in Wind Engineering, was held at Roorkee in 1985 (this has since become a 4-yearly event-rotating amongst the various countries of the region), followed by another event in Delhi in 1990. Dr. Prem Krishna was elected president, International Association of Wind Engineering for the period, 1991-1995, and organized the 9th International Conference on Wind Engineering (a 4-yearly world conference) in New Delhi in 1995, which was held for the first time in India.

His pursuits in Wind Engineering R&D included studies on chimneys, cooling towers, tall buildings, bridges, antennae dishes, and the like. He was also actively engaged in the development of codes and standards. He encouraged the establishment of a commercial Wind Tunnel facility of International standards by M/s. JP Associates, and served as their Chief advisor. He also engaged actively in Wind Disaster Mitigation, co-authoring the Vulnerability Atlas of India (1994), and, its revision in 2007, besides serving on NDMA committees.

Prof. Prem Krishna with Professor Toshio Miyata, a Japanese bridge aerodynamics expert, at the largest wind tunnel in Tsukuba during 1992 (In the background is the 1/100 scale model of Akashi Kaikyo bridge, the longest suspension bridge)

Dr. Prem Krishna greeted by Prof. Alan G. Davenport, a doyen amongst Wind Engineers, at the inauguration of the 9th International Conference on Wind Engineering, 1995 held at New Delhi

WORK IN OTHER AREAS

Besides the two above mentioned major areas of work, Dr. Prem Krishna, also contributed to steel bridges and buildings, and actively involved with the Institute of Steel Development and growth (*INSDAG*). He also helped in the design of a 38.5 m dia. bamboo dome for the Indian Pavilion at the Shanghai Expo 2010. Further, he closely associated with the analysis, design and construction of a 114 m high *murty of Lord Shiva* at Nathdwara in Rajsthan. He is currently a member of TAGs (Technical Advisory Groups) of several railway projects of national importance. Dr. Krishna has also contributed in producing documents of general professional interest. He was the co-Author of three important publications, namely, *Glimpses of Indian Engineering Achievements, VISION 2037 Document, and, Urban Transportation – Challenges and Way Forward,* all published by the Indian National Academy of Engineering.

AWARDS AND MAJOR PROFESSIONAL RECOGNITIONS

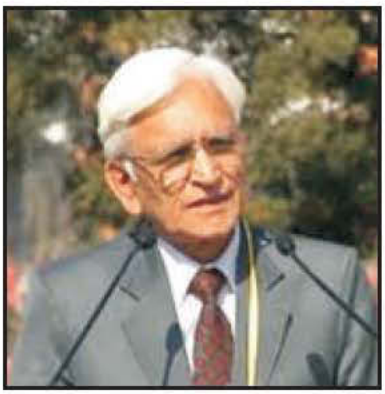
The awards and recognition won by him include:

- Distinguished Alumnus Award, IIT Roorkee, 2012.
- Gourav Award of the Association of Consulting Civil Engineers (India), 2012.
- Lifetime Achievement Award, Indian Society of Wind Engineering, Celebrating 20 years of Establishment, 2013.
- Vice-President INAE, 2008-13.
- President, International Association of Wind Engineering, 1991-95.
- Founder President, Indian Society of Wind Engineering, 1993-2000.
- Chairman of the Research Council of CSIR –CBRI, Roorkee, 2010 - 2017.

Being admitted to the coveted Fellowship of the Indian National Academy of Engineering, in 1988 by the then President, Dr. Jai Krishna

Addressing the annual convocation of the Visvesvaraya Technological University (VTU), Belgavi, Karnataka in 2017

At the National Conference on Wind Engineering, 2004, at Nagpur, where a volume containing papers from the International community of experts in Wind Engineering was released to honour Dr.Krishna



(a)Receiving the Distinguished Alumnus Award of the IIT Roorkee from its Director, Prof. Pradipta Banerjee, 2012 (b) Responding to the award.

THE FAMILY

Dr. Krishna is endowed with rich inheritance from his eminent father, Prof. Jai Krishna, and, his professional pursuits are backed up by a supportive happy family. Prem Krishna married his wife Lata Rani in 1965, a devout home-maker interested in social causes, who is a pillar of strength for him. They are blessed with two daughters, Shalini (married to Rajiv Mohan Gupta, currently Deputy Commandant & Dean at AFMC, Pune), and, Sonia (married to Saurabh Govil, President HR-Global, Wipro). They have four grandchildren, Rishi, Sagar, Raghava and Pranav, all in different stages of study/work.

About The Author

Dr. N. Subramanian is an award winning author, consultant, researcher, 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, Principles of Space Structures, and Building Materials, Testing and Sustainability and 270 papers.

REDEVELOPMENT - SELF v/s BUILDER

By Siddharth Tipnis

This is in continuation of my Writeup on Self-Redevelopment in ISSE Journal Volume 22-2: Lot has been talked about the state of affairs pertaining to the Construction Industry, over the last eight to ten years, which is supposed to be the backbone of our Country's economy, only next to Agriculture. This industry has never looked up, especially in the **residential and commercial** segments, after the beating it took, thanks to the world-wide recession of the 2008-9, along with other all-important industries like the manufacturing, production, MSME's, etc. The industry which was once ruled over by the Builder Lobby for almost three decades collapsed like a pack of cards.

On analyzing the likely reasons that may have effected this downward trend could be attributed to many reasons, the prominent among them being the formation of Real Estate (Regulation & Development) Act 2016 by the Central Government, enacted on 25th March 2016 and enforced on 1st of May 2016 followed by Demonetization of the Indian currency on the 8th of November 2016 and introduction of GST in July, 2017. The formation of Maharashtra Real Estate Regulatory Authority (MahaRERA) under the Chairmanship of Mr. Gautam Chatterjee (Retd. IAS officer) which made the Real Estate (Regulation and Development) Act (RERA) applicable on the 1st May 2017, under the ambit of which all construction activity was regularized. proved to be the final nail in the coffin. This led to a sudden and overnight change in the scene how the Builders had to operate. An industry whose turnover depended on 30% of black component, was left high and dry with loads of responsibilities in clearing secured and unsecured debts along with the responsibility of clearing investors lending's.

An unforeseen calamity or better described in modern times as the pandemic worse than the present Corona Virus seemed to have engulfed the Builders. This led to the collapse of all the unscrupulous and fly by night builders to either put their shutters down or abandon their projects and run away leaving the occupiers high and dry. This didn't end here. Over a period of time the downfall of the so-called cash rich NBFCs like the ILFS, DHFL, Private Lenders, etc., who formed the backbone of liquidity for the Builders did not spare even some of the A class builders. The statistics show 5,600 number of builders, either having closed shop or disappeared for good, leaving almost 1,25,000 people to fend for themselves. Mumbai city and Suburbs have within them almost 2,00,000 plus units unsold or unoccupied due to either non-completion or delays in obtaining occupancy certificate (OC) due to non-payment of the applicable premiums.

The introduction of Development Control and Promotion Rules – 2034 (DCPR – 2034) in March 2016 and after number of modifications, finalization of the excluded portions and finally brought into force on the 13th of November 2018, did not bring any cheers to the Builder's fraternity. The rule of relating FSI in proportion to Road Width abutting the property under development ate into their profits considerably, especially for plots having area less than 4,000 sqm and maximum FSI of 3. Records show that 95% of the plots in the Island City and the surrounding Suburbs are less than this area thus leaving very little choices for the Builders. In fact, the only choice that the

Builder has and that too if he is at the least an "A" class Builder, is the Slum Redevelopment Projects – developed under Slum Redevelopment Authority (SRA). Majority of the SRA projects in Mumbai and Suburbs are 10,000 sqm plus.

The Government on their part, had to come up with an alternative as people thrown out of their houses required to be rehoused. With absolutely no cash flow in the Builders market drastic changes were needed to be introduced to keep the Residential Market up and kicking. Thus, under the Maharashtra Regional and Town Planning act 1966 (MRTP Act-1966), the Municipal Corporation of Greater Mumbai (MCGM) was allowed to make suitable amendments in the DCPR 2034. MCGM added a clause under Section 33 of DCPR 2034 viz: Clause 33(7)(B), wherein the societies opting for Self-Redevelopment were given an incentive FSI of 15% of the existing Built Up Area or 10 sqm per dwelling whichever is greater without any applicable premium (Free of Cost), to be paid to MCGM.

All the previous Development Rules, one may note, were known as Development Control Rules (DCR) till the year 1991. The newest revision, which will be implementable till the year 2034, is called the DCPR – 2034. The relevance of the word 'P' introduced in this regulatory document stands for "PROMOTION". Thus, it is very clear that the Government is keen to promote this industry in the best possible manner. Have they done that? Yes, by all means by offering incentives and easing out quite a number of procedures by making them user friendly. The different clauses under which development / redevelopment on Lands having different titles may be classified as follows:

1) DCPR – 33(5): MHADA / BMC lease hold Lands

2) DCPR – 33(6): Dilapidated or collapsed due to age or fire.

3) DCPR – 33(7): Cessed Buildings (Those constructed before 1969)

4) DCPR – 33(7)(A): Non-cessed tenanted / Co-operative Hsg Soc. buildings

5) DCPR – 33(7)(B): Co-operative Hsg Soc. Buildings having passed the age of 30 years.

The Self – Redevelopment of Co-operative Hsg Soc. falls under the clause 33(7)(B) above. It would be interesting to note that the advantages of Self – Redevelopment outweigh the advantages of development by Builder four folds. One needs to refer to Clause Nos 30 (Table no 12), 31,32 of the DCPR – 2034 and the Annual Schedule of Rates (ASR) of Land in question for the particular area for arriving at any conclusion. It would be interesting to know the reason behind the Builders, who in the present scenario, are averse to taking up Redevelopment of plots below 4,000 sqm. This can be ascertained by doing a "Case Study" based on the parameters given in Table No. 1 below:

TABLE: 1

Sr No	Description	SELF - REDEVLOPMENT	BUILDER
1	FSI – Reg. 30 Table No. 12	Yes	Yes
2	Fungible FSI – Reg. 31	Yes	Yes
3	TDR – Reg. 32	Yes	Yes
4	Incentive FSI under 33(7)(B)	Yes	No
5	Additional 10% FSI over Basic	Proposed	No
6	Incentive FSI free of Premium	Yes	No
7	Incentive for Set-Back Area – Island City	2.5 Times	2.5 Times
8	Incentive for Set-Back Area – Suburbs	2.0 Times	2.0 Times
9	Plot Area Considered	Net	Gross
10	Minimum Area to be provided	No	300 sqft
11	Fungible FSI – Premium for Rehab	N/A	Applicable
12	Fungible FSI – Premium	35% of ASR	50% of ASR
13	Premium FSI – Premium	35% of ASR	50% of ASR
14	Premium Payments	Instalments	N/A
15	TDR rate	50% Market	N/A
16	Clearances and Approvals	Single Window	N/A
15	Time for approvals	Six months	N/A
16	Land Ownership	With Society	POA to Builder
17	All Permissions	On Society's Name	On Builder's Name
18	Third Party Encumbrance	N/A	Applicable
19	Project Ownership	Society	Builder
20	Funds	Bank	NBFC
21	Rate of Interest	12.5%	18%
22	Govt Rebate in Interest	4% (Proposed)	N/A
23	Development charges (DC) Land & Building	50% of Applicable	100% of Applicable
24	Development Cess	50% of DC	100% of DC
25	Stamp Duty Reg., LUC charges	Minimal	100% as applicable
26	Corpus Fund (Free Maintenance)	Life Long	10 years

CASE STUDY : Based on data in Table No.1

TABLE : 2

1)	Building Age	=	> 30 years	
2)	Land Situated	=	Suburbs	
3)	Road Width Abutting Land	=	12.3 m (40'-0")	
4)	FSI Allowed	=	2.2	
5)	Add 35% Fungible	=	2.97	
6)	Land Area	=	1,1858.05 sqm = 20,000 sqft	
7)	BUA	=	20,000 sqft	
8)	FSI consumed	=	1	
9)	Existing Carpet Area	=	17,000 sqft	(85% of BUA as per MOFA)
10)	New BUA (FSI 2.97)	=	59,400 sqft	
11)	New Carpet Area	=	53,460 sqft	(90% of BUA as per RERA)
12)	Desired extra CA	=	40%	(By old Members)
13)	New C-Area above Existing	=	6,800 sqft	(40% of no. 9)
14)	New C-Area to members	=	23,800 sqft	(9 + 13)
15)	Area Balance for Sale	=	29,660 sqft	(11 – 14)
16)	Land Rate	=	8,300 / sqft\	

To determine the Project Cost Based on the above Data for BUA = 59,400 sqft

TABLE: 3

Sr No	Description	Rate/Unit Self – Redev	Amt (In Crs) Self - Redev	Rate / Unit Builder	Amt (In Crs) Builder
1	Construction Cost	3,200.00	19.00	3,200.00	19.00
2	Approvals & Premiums	3,800.00	22.57	4,700.00	27.92
3	Rentals	1,800.00	10.69	1,800.00	10.69
4	Additional Duties, Taxes, Fees, etc	1,400.00	8.32	1550.00	9.20
5	Project Cost		60.58		66.81
6	Investment Expected (50% / 50% of PC)		30.29		33.40
7	Interest for 3 years (9% / 18%)		8.18		18.04
8	Profits on Investment (0% / 50%)		0.00		12.03
9	Final Project Cost (5+7+8)		68.76		96.88
10	Rate of Project Execution (per sqft)		11,580.00		16,300.00

The inference that we can draw from the above data is that the cost of Project completion in case of Self – Redevelopment is almost 40% lesser than that incurred by a Builder. This enables the members to enjoy 40% greater benefits if they take that little bit of extra risk of executing the project in-house. The extra benefits reaped by the members are given in Table No. 4 below:

TABLE: 4

Sr No	Description	Self-Redev	Builder-Redev
1	Project Cost in Crores	68.76	96.88
2	Approx. Sale Rate	30,000.00	30,000.00
3	Area reqd. to be sold for recovery of PC	22,920.00	32,290.00
4	Area Balance for Sale as per pt. no. 15 in Table 2	29,660.00	29,660.00
5	Excess / Shortfall (3 – 2)	6,740.00	-2,730.00
6	Gain / Loss in Returns (2 x 4) due to excess Area for Sale	20.22	-8.19
7	Readjustment in Project Cost (1 – 5)	48.54	107.07

It is obvious from Table 4 that the Builder is at a clear disadvantage if you compare apple to apple. He has no other choice but to sell extra area to recover the cost which subsequently affects his profits and therefore the project becomes unviable for him. As far as the Society is concerned the extra income can be channeled towards creating a corpus that can take care of the monthly maintenance, lifelong. The balance amount, if any can be divided in proportion to the carpet area held by each individual member.

It thus becomes a bounded duty of all Architects, Engineers, Technocrats and other Professionals to educate people (read Societies) and make them aware of the importance of approaching Consultants in the field before the Builder and save themselves from hardships that they may fall prey to, due to the false promises of the Builders.

About The Author

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OVERVIEW ON REVOLUTIONARY CLASS OF REPAIR MORTAR

By Salil Gadgil

In structural repair works, the evolution of latex based polymers has given an advent to a trend of it's site based addition or use of ready to use polymer modified mortar(PMM) . In comparision with normal cementitious mortar, PMM is marginally effective in improving mechanical properties and also falls in economical repair range.

A normal cement mortar is a combination of cement, sand and water. Addition of polymer is done to prepare mortar for augmenting physical properties of cement which render additional advantageous properties in a repair system viz:-

1) Enhanced mechanical strength characteristics.
2) Higher toughness as compared to normal mortars.
3) Lower permeability & better resistance against corrosives /salinity.

As a most functionally superior system, epoxy mortar renders enhanced functional properties but comes at a premium range and hence may not fit the bill where cost of construction has to be stringenty maintained at lower levels. So, there is a dire need for economical repair mortar alternative to epoxy, having similar properties as that of pure epoxy mortar from durability perspective.

A new class of repair mortar i. e. cementitious epoxy latex modified version is most feasible option in such cases. This article speaks about technical features of this mortar with respect to both cementious and pure epoxy mortar with findings.

Following classes of polymer latex are available globally for cementious matrix modifications:

A. Elastomeric Latexes:

- Natural rubber latexes
- Synthetic rubber latexes which further is available in :

a. Styrene butadiene rubber (SBR)
b. Chloroprene rubber (CR)
c. Methyl Methaacrylate-butadiene rubber
d. Acrylonitrite-butadiene rubber (NBR)

B. Thermoplastic Latexes:

- Polyacrylic Ester (PAE)
- Poly (Ethylene-Vinyl Acetate) (EVA or VAE)
- Poly (Styrene Acrylic Ester) (SAE)
- Polyvinyl Acetate (PVAC)
- Polyvinyl propionate (PVP)
- Polypropelene (PP)
- Poly (Vinylidene Chloride- Vinyl chloride) (PVDC)

C. Thermosetting Latexes: Epoxy Type

D. Bituminous Latexes:

- Asphalt
- Rubberized Asphalt
- Paraffin

E. Mixed Latexes

There are two types of Mortar Systems mostly popular in India:

- Cement Based Mortar Systems – Cement is a constituent in these mortar systems
- Epoxy Based Mortar Systems – Cement is not a constituent in these mortar systems.

CEMENT BASED Mortar systems are modified with SBR Latex / Acrylic Latex (ASTM 1059 Type I

latex systems which are reemulsifiable) based polymers. This mortar will comprise of

Cement – 1 Part By weight
Sand – 3 Parts by weight
Water – 0.35 to 0.40 Parts by weight of cement
Acrylic or SBR Latex Polymer- 0.15 Parts by weight of cement

EPOXY BASED Mortar Systems are made with neat Epoxy systems. Here they do not use cement and hence they comprise of

Epoxy Part A
Epoxy Part B
Graded Quartz Filler- 3 to 5 times of Epoxy

A proposed new class Cement Mortar modified with moisture compatible epoxy latex systems (ASTM 1059 Type II latex systems which are non reemulsifiable) will comprise of
Cement – 1 Part By weight
Sand – 3 Parts by weight
Water – 0.35 to 0.40 Parts by weight of cement
Epoxy Latex based additive - 0.15 Parts by weight of cement
Bonding coat of same material can be applied prior to laying of subsequent mortar.
This class of mortar admixed with epoxy latex based additive is evaluated based on following parameters:

1. Bond Strength in moist conditions when used as a bonding coat prior to mortar laying:

Average relative humidity in air throughout the year in Mumbai and other similar coastal areas is more than 75% and as per codal provisions non re-emulsifiable conforming to ASTM-1059 Type II shall be used for any structural repair works in the areas of higher humidity.

(Fig A: Standard test method for Bonding Agent)

This bonding coat when tested as per ASTM 1059 Type II and ASTM C 882/881 gives a bond strength of >10 MPa which is greater than codal criteria of 8.61 MPa.

2. Improved tensile and flexural strength:
Generally repair mortars are applied in tensile zone i.e. slab or beam bottom. In such cases, repair mortar having better tensile and flexural strength is preferred which can sustain those loading parameters without cracking.
When such mortar is tested against those parameters, values were:

Parameter	Unit	Values
Tensile Strength @28 day	MPa	10.50
Flexural Strength @28 day	MPa	15.50

These values are much superior as compared to acrylic or SBR admixed repair mortar.

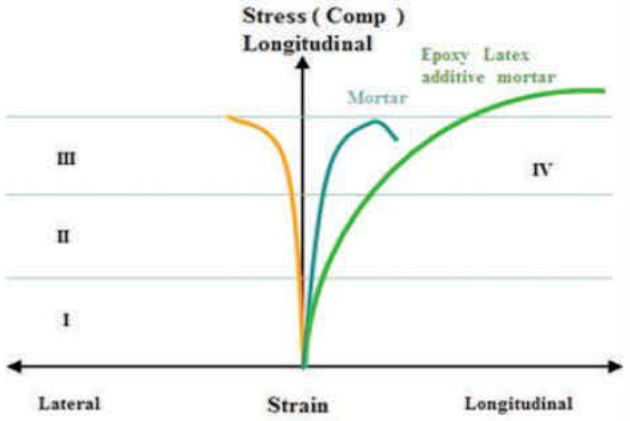
3. Lower water absorption:
Typically mortar/concrete has water absorption value of 2-3% , but epoxy modified repair mortars

have lower water absorption value to the tune to 0.02 %. This clearly indicates that there is hardly any room for moisture and water to ingress upto reinforcement bars after applying a cover of this mortar. This resultant cohesive matrix is a critical parameteric requirement from durability perspective especially in repairs of concrete core sections.

4. Nature of mortar matrix:

These types of mortars are visco-elastic in nature, having higher flexibility than traditional mortar. Consequentially they have higher resistance to fatigue loads which is a critical parameter in repairs and strengthening of high rise structures, bridges or industrial structures.

5. Higher Fracture toughness and impact strenath:



(Figure B: Stress-Strain behaviour comparison)

It is observed that critical stress intensity factor and fracture energy increases by minimum 50% and 200% respectively after addition of 10% epoxy latex additive. In case of floor repair works especially industrial units, bridge decks the application demands repair mortars with similar properties.

As indicated in above stress strain curve, area under curve increases drastically as compared to control which in turn enhances toughness of modified mortar.

6. Resistance to weathering attacks:

Repair mortar admixed with epoxy latex additive creates a cohesive mix with lesser voids and microcracks resultantly resisting the ingress of detrimental elements such as chloride ions, carbon dioxide, sulphates etc. So, chances / timelines of re-repairing the structure minimizes drastically with these kinds of systems.

7. Thermal compatibility:

Coefficient of thermal expansion value of epoxy latex systems matches to that of concrete and as such both the materials behave monolithically even in drastic changes in temperatures throughout the year. So, these systems are not susceptible to thermal cracking as compared to epoxy mortars in thickened sections.

Conclusion:

- Epoxy latex systems derive beneficial aspects from both epoxy system and latex systems and renders better durability as compared to traditional Acrylic or SBR Latex Polymer latex modified mortar.
- Cost wise, epoxy latex system cost marginally more than the normal latex system but is priced at just 20% of the cost of epoxy mortar system on per cubic meter basis rendering the properties at par with epoxy mortar system.
- This technology has been successfully used in repairs of several critical structures like silos, cooling towers, chimneys, bridges and numerous residential and commercial structures and has successfully its functional expectation.

About The Author

Salil Gadgil is working as Technical Support Manager at M/s Krishna Conchem Products Pvt Lts. and having 16 years of experience in repair systems. He can be reached at info@krishnaconchem.com

CLIMATE CHANGE & SUSTAINABLE ENERGY : WHAT YOU CAN DO ABOUT IT…

By Vedang Vadalkar

In its Fifth Assessment Report, the Intergovernmental Panel on Climate Change (IPCC), a group of 1,300 independent scientific experts from countries all over the world under the auspices of the United Nations, concluded there's a more than 95 percent probability that human activities over the past 50 years have warmed our planet. The industrial activities that our modern civilization depends upon have raised atmospheric carbon dioxide levels from 280 parts per million to 414 parts per million in the last 150 years. The panel also concluded there's a better than 95 percent probability that human-produced greenhouse gases such as carbon dioxide, methane and nitrous oxide have caused much of the observed increase in Earth's temperatures over the past 50 years. Scientists attribute the global warming trend observed since the mid-20th century to the human expansion of the "greenhouse effect" — warming that results when the atmosphere traps heat radiating from Earth toward space. On Earth, human activities are changing the natural greenhouse.

Over the last century the burning of fossil fuels like coal and oil has increased the concentration of atmospheric carbon dioxide (CO2). To a lesser extent, the clearing of land for agriculture, industry, and other human activities has increased concentrations of greenhouse gases. The consequences of changing the natural atmospheric greenhouse are difficult to predict, but some effects seem likely:

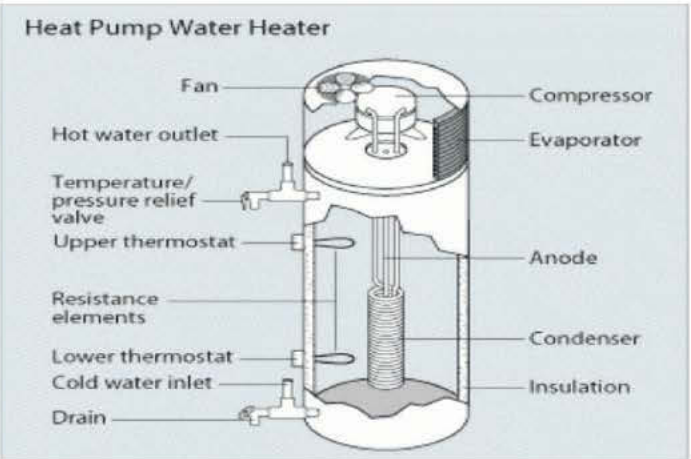
- On average, Earth will become warmer. Some regions may welcome warmer temperatures, but others may not.
- Warmer conditions will probably lead to more evaporation and precipitation overall, but individual regions will vary, some becoming wetter and others dryer.
- A stronger greenhouse effect will warm the ocean and partially melt glaciers and ice sheets, increasing sea level. Ocean water also will expand if it warms, contributing further to sea level rise.
- Climate extremes, such as droughts, floods and extreme temperatures, can lead to crop losses and threaten the livelihoods of agricultural producers and the food security of communities worldwide.
- Finally, although rising CO2 can stimulate plant growth, research has shown that it can also reduce the nutritional value of most food crops by reducing the concentrations of protein and essential minerals in most plant species. Climate change can cause new patterns of pests and diseases to emerge, affecting plants, animals and humans, and posing new risks for food security, food safety and human health.

The Earth's climate has changed throughout its history of over 4 billion years. Just in the last 650,000 years there have been seven cycles of glacial advance and retreat, with the abrupt end of the last ice age about 11,700 years ago marking the beginning of the modern climate era — and of human civilization. “Scientific evidence for warming of the climate system is unequivocal.” - IPCC. Ancient evidence or paleoclimate evidence reveals that current warming is occurring roughly ten times faster than the average rate of ice-age-recovery warming.

Our personal vehicles are a major cause of global warming. Collectively, cars and trucks account for nearly one-fifth of all US emissions, emitting around 2.87 kg of carbon dioxide and other greenhouse gases for every liter of fuel. Cars produce more greenhouse emissions compared to other means of transportation like walking, biking or using public transport. A sustainable solution to the internal combustion engine powered vehicles is the adoption of electric vehicles. But currently the push towards getting an Electric Vehicle (EV) is severely limited by the range and the charging infrastructure in most parts of the world. The first step towards EVs is setting up worldwide charging infrastructure and a universal connector for charging. The next step in this evolution would be completely shifting the EV charging to solar power for driving our cars free of charge year-round. There is also another constraint for getting an EV, the psychological barrier of range anxiety. We can overcome this by easily available charging locations like the ubiquitous fuel stations to push people towards making the shift.

India has abundance of available solar potential almost year-round. We can harness this energy, similar to rainwater harvesting, to power smaller household appliances. LED bulbs and other lower wattage appliances can be easily powered by solar panels and batteries. Solutions similar to Tesla Powerwall will help in increasing the push for home renovations. Powerwall is a solution from Tesla that stores electricity when electricity generation is available, such as during a sunny day for solar energy or a windy period for wind energy, or the grid power available for cheap. Then the stored energy can be used during peak hours of consumption mostly in the evening when solar energy is no longer available. This would help relieve the enormous stress on the electric grid in metropolitan areas where the energy demand is usually very high. It can also be helpful in the rural areas where the energy demand is minimal and can be entirely powered by the Powerwall batteries and fully renewable energy sources with only emergency back-up from the grid making these communities fully self-sustainable.

Other potential solutions for making small tweaks on a household level which will make a huge impact at scale are moving to a conduction cooktop instead of gas stove, Heat Pump Water Heater, Heat Pump HVAC systems, and Heat Pump dryers. Along with other software solution suite that helps operate all this equipment in tandem. The building shell improvements can go a long way in reducing the cooling and heating loads and help reduce the reliance on large HVAC units for office buildings. Building envelope can be used to retain the heat/coolth inside the building thus reducing electricity consumption. Huge glass facades for buildings can also be avoided in order to reduce the cooling capacity requirements for the building.



Solar tempered house and good R-value windows is also a worthy investment to reduce energy consumption. In the context of building and construction, the R-value is a measure of how well a two-dimensional barrier, such as a layer of insulation, a window or a complete wall or ceiling, resists the conductive flow of heat. R-value is the temperature difference per unit of heat flux needed to sustain one unit of heat flux between the warmer surface and colder surface of a barrier under steady-state conditions. R-values are additive for layers of materials, and the higher the R-value the better the performance. People don't know much about the techniques used to conserve energy at household or society level other than PV for a net zero home. Taking building envelopes into consideration helps deal with the commercial buildings and also small single-family homes It helps with modelling buildings that can help with planning and subsequent construction of buildings and help save CO2 emission.

The methods used to tackle power savings in commercial buildings are very different than a single-family home. These buildings can be used in a different way to provide max daylighting and generate solar electricity with their large footprint and can use the same technologies as Heat Pump Water Heater and shifted EV charging to maximize the use of solar electricity. Passive solar homes will result in the most CO2 emission savings and reduce utility bills. Actively planning for CO2 reduction right from the design stage of the project will help in reducing the CO2 emissions.

Construction industry is a major contributor to CO2 emission. Building materials like cement , steel , bricks add to it. Bad planning increases use of electricity. Box type glass structures demand more use of electricity for lights and air conditioning. Negligence in maintenance is another major factor causing the need to demolish the structures.

We, as Civil Engineers, can help in planning sustainable constructions. National Building Code of India 2016 has part 11 on Approach to Sustainability. With integrated planning and design of our built environment, we can help to mitigate the climate change. Efficient planning of buildings and infrastructure projects will reduce the material consumption, overall construction cost and maintenance cost. We should adopt Life Cycle cost approach while choosing the best alternative. Blended cements can be used which will improve the durability and reduce cement consumption. Fly ash based products like AAC blocks should be promoted in place of burnt clay bricks which will reduce the dead weight of structure and is a better eco-friendly alternative. Precise planning of site activities will reduce the material wastage. We can reduce consumption and wastage of water for our construction activity. Rainwater harvesting and use of recycled water is the need of the hour. Reuse and recycling of construction debris will save precious natural material. Recycled aggregates can be used to produce concrete blocks and other non-structural concrete elements. Increasing use of renewable energy will bring down the operation cost. We should aim to build green rated projects which will not only improve quality of life but will have long lasting impact on fight against climate change.

We can achieve the IPCC targets and actually make a difference worldwide. It doesn't have to be the government taking steps for reducing emissions, people can make these small changes that have huge impacts and help in staying under the 1.5 degree warming target.

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RESIDENTIAL TOWER SALSETTE 27

By Sameer Hadker

Salsette 27 is an eye-catching development in Byculla, Mumbai. The two slender towers which sit on a common podium leave the viewers in awe because of its slenderness ratio, which is a stunning 9.6! The upper levels of the structure overlook the Mahalaxmi racecourse and Haji-Ali dargah on one side and Mumbai's docks and neighboring islands on the other. Thus with 2 basements, a ground floor, 7 podium levels and 57 upper floors, the structure has a total height of 231 meters above the ground level!

Peninsula developers have pampered home owners with the luxurious amenities, healthcare and entertainment facilities located in the complex. The recreational level which is located at the top of the parking podium houses a swimming pool, two storey gymnasium, various sports facilities and much more. Above the 52nd floor there are ultra-luxury apartments with larger floor plates which cantilever by 1.5-2 meters on all sides. These are supported by transfer girders, which are not often found at such a height!

A Jain temple was planned on the top of the podium.

The temple being a place of high spiritual energy, required some special regulations to be adhered to. The core of the temple, known as the "Garbha Girha" had to be founded on soil and had to have a connection with the earth. This required construction of a shaft filled with soil to support the temple, so that the requirement could be met. The soil shaft was designed similar to a lift well, which our engineers cleverly utilized as a structural member to support the podium floors. The Architects designed a grand temple which weighed 350 metric tons and was structurally isolated from the main building with a construction joint.

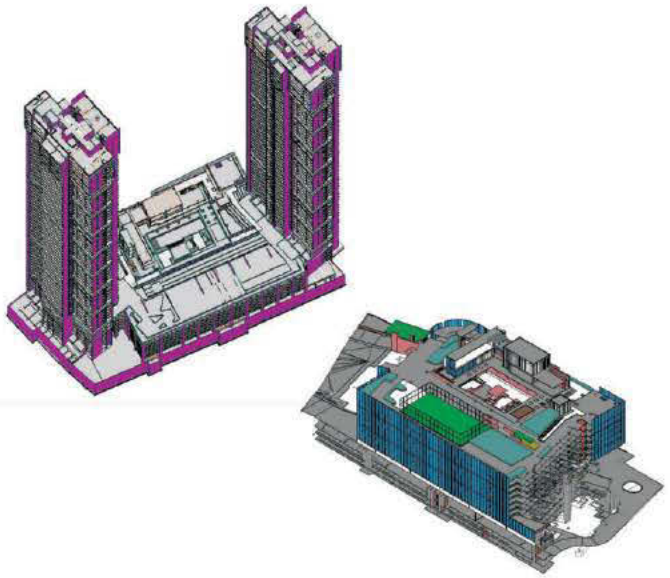
The project gained additional FSI by providing parking area for an MCGM Pay and Park on two basement levels and the ground floor. There is a separate entrance provided for residents to access the seven podium levels by ramps. In a residential development project in Mumbai, it is great news for a client when he receives additional FSI to construct additional floors to sell. Much to the designer's dismay, this news came after the designs for the raft foundation were finalized and excavation was completed. In addition to this, contractors had already mobilized a workforce at site of over 700 laborers. The costs of demobilizing or keeping the work on hold would be

very high, thus, to make sure that the flow of work does not stop, our engineers had to work on full throttle to issue the revised detailed design drawings on site. It was a race with the progress on site!

The additional floors increased loads on the raft and caused punching shear. To cater to this additional load, the walls in the basement were strengthened by increasing their thickness by 100 mm and shear reinforcement was increased in the raft. The raft had to be poured in three parts to control temperature and each part was poured in layers of 300 mm.

An interesting occurrence on this site was the 140 ton per meter sq. bearing capacity which was unusually high. To verify this, a footing load test was also carried out. In addition, Contractors conducted ground improvement, in which they identified the soft areas in the ground surgically excavated them and filled them with self-compacting concrete. It is important to note that the structure's interaction with the soil must be given special attention as it is the region most probable to lead to failures.

ETABS and SAFE are in the everyday vocabulary of a structural consultant. These software packages are great for modelling building behavior and generating fast and accurate results. In this project, promoting the use of the software for the next generation, our team at Sterling used REVIT which is a Building Integrated Modelling (BIM) tool. With all consultants working on one model, this tool boosts efficiency in collaborative planning and gives 3D renders of the structure which overcomes the shortfalls of 2D drafting. 3D modelling allows the architect to identify any errors in the floor plans and sections. Sections and plans are developed automatically from the model which can produce output as a drawing file, thus reducing the workload on draughtsman and the probability of human error.



As we all know, change is a constant. It is our mindset and our response which matters. Structural engineering consultants are far too used to this. A project may seem simple, but with changes in municipal by-laws and client/architect requirements, new challenges surface which require pioneering solutions. Construction work has now resumed after the lockdown restrictions have been eased in Mumbai and on completion, Salsette 27 will add to the skyline of the city of Mumbai and our team at Sterling will look at it with great pride.

Acknowledgements:

Sterling's Project Team

General Manager: Dinesh Bhaud

Project Leader: Karan Sitapara

Draughtsman: Devendra Maurya, Vinayak Bhogle

About the author :

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 JULY TO SEPT 2020

By Hemant Vadalkar

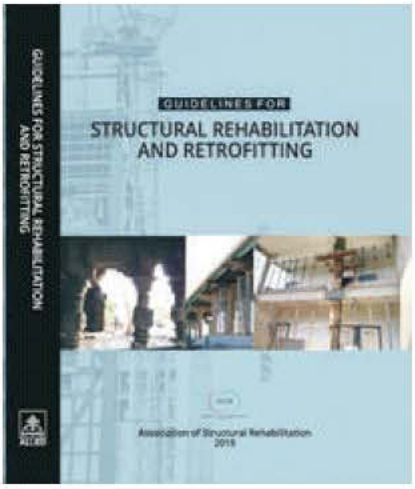
4 July 2020 : ISSE Student Help Group arranged webinar on Structural Design Services by inviting Girish Dravid and Nikhil Sanghavi. Nikhil Sanghavi moderated the event and Girish told his experience in Structural Engineering since his college days and during his professional career. He explained about the practice of Structural engineer, how the coordination among the Architects, client and project team is important. He also narrated the work flow in structural consultant's office and challenges faced by design team. It was very helpful for students who want to opt for Structural engineering as their specialization and career.

7 July to 12 July 2020 : Sandip Polytechnic, Nashik jointly with ISSE conducted online course on Design of RCC structures for the fresh civil engineering graduates. Various professionals in the field of civil engineering guided students on various topics. Er. Umesh Joshi from J+W Consultants talked on materials and loading to be considered. Er. Madhav Chikodi talked about slab design. Er. Milind Shinde elaborated on design of beams. Er. Vatsal Gokani described the procedure for design of columns and shear walls. Shekhar Ghate of Optimal Consultant talked on foundation design and Hemant Vadalkar talked on use of software for design of structures. The programme had very good response and attended by more than 500 students.

11 July 2020 : Association of structural Rehabilitation (ASTR) launched book

"Guidelines for Structural Rehabilitation and Retrofitting "

The Indian Infrastructure and Construction Sectors have moved to nascent stages. At the same time industry is spreading its arm in Rehabilitation and Retrofitting field. Concerning to the outgrowing needs in SRRR field, many research scholars, and practicing experts has introduced various specialized techniques in this field. It is critical to keep up with industry need and the Structural rehabilitation industry is no exception. In India, the SRRR industry is not organized, hence the formation of an association to gather all the experts, scholars, like-minded people were in utmost need. Concerning to this requirement the foundation of Association of Structural Rehabilitation was laid in year 2008. The combination of adept seniors and diligent youngsters has made the association successful within a short period of time by accomplishing every objective such as developing and promoting the science of rehabilitation, creating and sustaining the atmosphere of correct engineering practices etc. On 11th July 2020, ASTR launched a comprehensive Guideline for Structural Rehabilitation and Retrofitting in South East Asia's market. With inexplicable joy, this E-launching ceremony was culminated in the presence of Chief Guest Dr. Venkatesh Kodur, Michigan State University, panellists- Dr. N. Gopalakrishnan



(Director CBRI), Shri. Sanjay Pant (Head Civil Engg, BIS, India), Shri Vinay Gupta (President IIBE and ICI), Mr. Shantilal H Jain (ISSE President), Dr. G. R. Reddy (President, ASTR) and Prof. Shamsher B. Singh (BITS Pilani). Further the event had gone hand to hand with many experts. The reviews and remarks were outlined by all the dignitaries while praising the Guidelines. The continual series of heartfelt appreciation happened for the efforts taken by all the authors. This prestigious ceremony was moderated by Dr. Gopal Rai (Hon. Secretary of ASTR) who has gathered all the practicing experts on this single platform six years back. The memory lane for the making of guidelines was picturized by Dr. Abhay Bambole & Dr. Suriya Prakash, they expressed the gratitude and esteem for every individual who has made a significant contribution towards the destination of this guideline.

While summing up the event everyone has shown believe on this guideline and titled it as Best Guidelines in Contracting, research, consulting, and government sector. No matter whether it is 1st Guideline or not but acceptance for this from the industry has already accounted in the achievement. This proud moment has end up with National Anthem. These guidelines will be useful for Consulting Engineers, Repair Contractors, Clients, Academicians engaged in repair work as there is no exhaustive guideline available on the subject yet.

14 July 2020 : ISSE webinar with TMU Moradabad on Solid waste management by Dr. Mohan Dagaonkar, former Chief Engineer , Navi Mumbai Municipal Corporation. Dr. Dagaonkar explained how he implemented the central government guidelines for solid waste management and turned Navi Mumbai in to award winning clean city of Maharashtra. Other Corporations should immolate this success storey of New Mumbai Municipal Corporation.

18 July 2020 : Umesh Dhargalkar conducted a webinar on Geotechnical investigations and foundation aspects with two experts Jaydeep Wagh and Shekhar Vaishampayan. Both the experts shared their experience on the topic and discussed various case studies.

22 July 2020 : ISSE webinar on "WIND LOADING ON TALL BUILDINGS : REVIEW OF IS 875-2015 (PART 3) & RECOMMENDED AMENDMENTS" by expert Dr. K Suresh Kumar , Vice- President RWDI was arranged. Dr. Suresh Kumar explained various code clauses and provided international guidelines on wind engineering.

5 Aug 2020 : ISSE arranged a webinar on Extremely durable structures. A lecture by Er. Mahesh Varma about Monumental and Heritage structures bult in stone masonry which are lasting for thousand of years was well appreciated by all.

8 Aug 2020 : ISSE Students help group lecture on Project Management was arranged with field professionals and moderated by Umesh Dhargalkar.

14 Aug 2020: Overview of NBC2016 and Indian Standards in Civil Engineering

ISSE in association with IEI Maharashtra State Centre and Bureau of Indian Standard arranged a webinar on “Overview of NBC2016 and Indian Standards in Civil Engineering”. Shantilal Jain President ISSE welcomed the guests and participants. Dr. H M Raje, Chairman IEI MSC introduced guest speaker Er. Sanjay Pant Director and Head Civil Engineering division Bureau of Indian Standard , New Delhi. Er. Sanjay Pant in his

two hours presentation elaborated various sections of National Building Code 2016 and recently revised various civil engineering standards. He stated that IS456 is being revised and draft will be circulated in two months. Presentation was very informative and provided update on various codes. Hemant Vadalkar , Hon Secretary ISSE thanked the Dynamic Director of BIS for excellent presentation and complemented the entire BIS team for their hard work in bringing huge number of revised civil engineering codes in a very short time span. The webinar was attended by more than 500 civil engineers.

25 Aug 2020 : Dr. N Subramaniam reported that " I am very sad to report the death of two prominent personalities, in the field of structural Engineering: Er N. Prabhakar and Prof. R.Radhakrishnan, Ex IITM. May their soul rest in peace. Our heartfelt condolences to their family and friends.

Our own Sefian and practicing Structural engineer in Mumbai Er Narasinga Rao Prabhakar, passed away on 25th August 2020 at 7 pm IST due to cardiac arrest (informed by his daughter to me).

He was an active member of IStructE (UK) and has experience of working in prestigious companies in UK (worked there for 13 years in companies like Tileman & Co., Sir Frederick Snow and Partners, John Whittaker and Associates and Seltrust Engineering Ltd.) and India (they include Dept. of Atomic Energy, Gammon India Ltd., ECC (L&T), and M/s CR Narayana Rao), and executed numerous industrial structures like Chimneys (more than 50 ranging in height from 30 to 230 m!), cooling towers (heights up to 141 m), Power plant structures, silos, water reservoirs, Port structures, multi storey office and car park structures. Many of us are aware that he developed several useful computer software packages for analysis and design of steel and concrete element and had authored over 25 technical papers on high-rise and industrial structures, published in national and international journals. He will be specially remembered for his thought provoking cartoons, which appeared regularly in the Indian Concrete Journal.

He was in touch with me exchanging information and discussing about failures. We jointly wrote a paper also.

More details about him may be found in the following link : https: // www. sefindia.org/ forum / viewtopic.php?t=13329

5 Sept 2020 : ISSE Student chapter inauguration function was conducted on virtual platform. ISSE team and HOD from Walchand college addressed the students. All the 32 post graduate students joined ISSE student chapter.

9 Sept 2020 : Webinar on Wind tunnel data integration with Wind speed and directionality factor was arranged by ISSE jointly with RWDI. Dr. Sureshkumar Vice President RWDI made the presentation and explained the importance of wind direction and wind speed based on the wind data and wind diagrams. He emphasised that, wind load on the structure can be reduced if the orientation of structure is decided based on the dominant wind direction at the site under consideration.

July to Sept 2020 : Deep Foundation Institute (DFI) India conducted webinar series on steel retaining structures and foundations using sheet pile applications. This includes installation of sheet piles, soil retaining structures, marine applications, coffer dams and extension of ports. Experts from Arcelor Mittal presented various applications of sheet piles .

12 Sept 2020 : Kerala Highway Research Institute (KHRI) conducted webinar on cold form steel houses by Dr. Prof. Arul Jaychandran of IIT Madras. He elaborated various applications of cold form steel panels for wall and façade. Cement Particle boards are fixed on either side of cold form section in dry wall construction. All the light gauge sections are connected with self tapping screws. Mass production of affordable housing using this technology is possible. BMTPC in their publication included this technology for housing projects. Proper quality control on cold form sections which are 0.5mm to 1mm thick with proper galvanization under factory controlled condition can provide durable houses. Speed of construction is very fast as these are light weight structures and can be erected at site quickly. This type of houses will have minimum life of 50 years.

25 Sept 2020 : Indian Association of Structural Engineers (IAStructE) conducted Panel Discussion on "Structural Engineering Practice in India: Introspection & Way Forward". Panellist were Dr. Sudhir Jain, Director IIT Gandhinagar, Senior consultant Prof. Mahesh Tandon, Ms Alpa Sheth moderated by Manoj Mittal, Consulting Engineer.

Various points were touched upon like Engineering education in our country, Capacity building in structural consultancy, Updating the latest knowledge through short courses and online events, Process of selection of consulting engineers QCBS system on merit plus cost basis and not only on L1, Engineers bill and its status, unhealthy competition amongst consulting engineers and working at very low fees. Concerns were raised on arrest of consulting engineer after collapse without any investigation and life time responsibility of structural stability.

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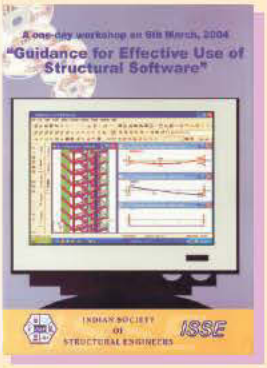

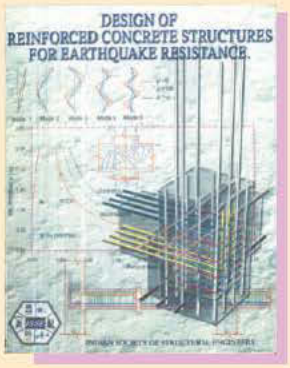

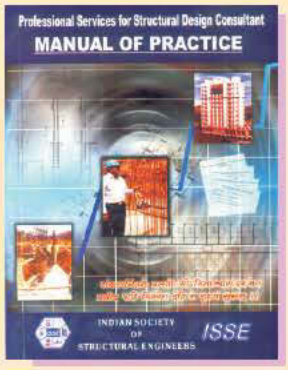

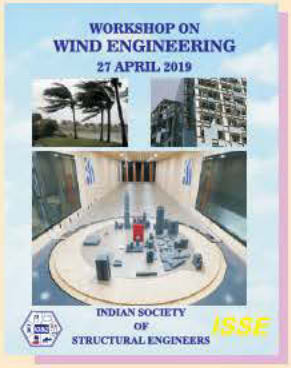

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