STRUCTURAL ENGINEERING

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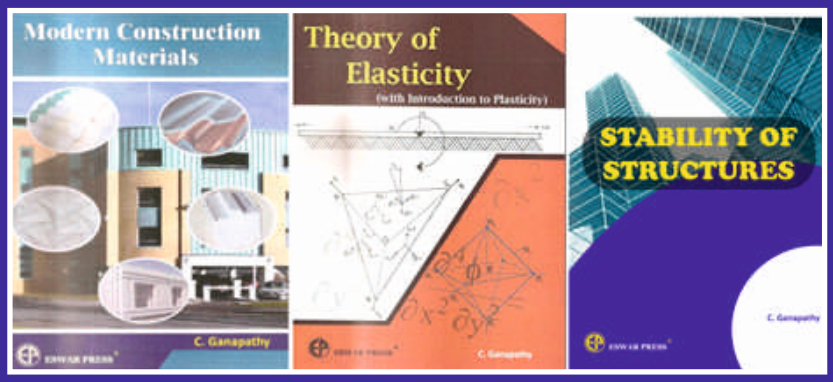
STRUCTURAL ENGINEERS

ISSE

VOLUME 28- 3

JULY - AUG - SEPT 2026



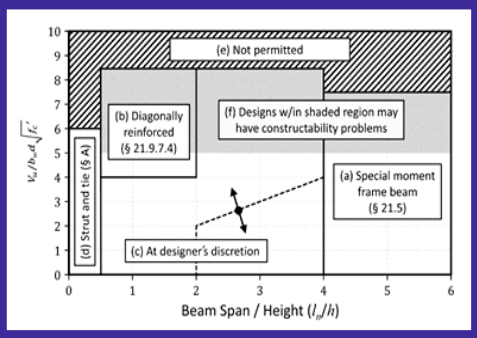


"GEM 49 PROF. C. GANAPATHY
- PIONEERING EDUCATOR, OFFSHORE STRUCTURES EXPERT,
AND INTERNATIONAL RESEARCH LEADER" see page 3





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Editor : Vatsal Gokani

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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 2026)

2740	Satish Kumar Gaddam	2754	Tejas Avinash Kotkar
2741	Sameer Kumar	2755	Rajiv R. Raveendram
2742	Jayprakash Natesan	2756	Swapnesh Pramod Wani
2743	Revathy Prakash	2757	Sagar Pandharinath Dumbre
2744	Parshuram Satish Dhalape	2758	Ajaykumar Jitendrabhai Desai
2745	Ammolh Anil Kulkarni	2759	Pratik Mahaveer Jogad
2746	Lokesh Kamalkishor Varma	2760	Mohan S. C.
2747	Amey Vinayak Diwan	2761	Shweta Ashok Sajjanshetty
2748	Rushikesh Bhagwan Honmane	2762	Himanshu Prashant Khedekar
2749	Fatima Uz Zehra Ansari	2763	Sarvesh Narendra Jadhav
2750	Nagasri Anjaneyulu Phanidapu		
2751	Vinayak Vasant Diwan	JM 94	Dhanaraj Mohan Patil
2752	Sucheta N. Patkar	JM 95	Priti Balkrishna Phalke
2753	Swapnil Deepak Kurhade	JM 96	Pradnya Ashok Desai

Patrons : 38
Members : 2763
Student Members : 1006

Organisation Members : 43
Junior Members : 96

Sponsor : 8
IM : 08

TOTAL STRENGTH : 3,962

GEM 49 PROF. C. GANAPATHY-PIONEERING EDUCATOR, OFFSHORE STRUCTURES EXPERT, AND INTERNATIONAL RESEARCH LEADER

By Dr. N. Subramanian



Prof. C. Ganapathy (1937-)

In the illustrious history of Indian structural and offshore engineering, Prof. C. Ganapathy stands tall as a pioneer, mentor, and innovator. His professional journey, which began in the early 1960s and spans more than six decades, reflects a life dedicated to excellence in engineering education, structural analysis, ocean technology, and sustainable construction materials.

EARLY ACADEMIC BRILLIANCE

Prof. Ganapathy was born on 25th April 1937 in Trivandrum, Kerala State. His father is Mr. M. Chembagaraman, a business man and mother Mrs. Muthammal, a home maker. All his education up to his graduation happened in Trivandrum. He had his school education at Government High School , Chalai, Trivandrum.

He earned his B.Sc. (Engineering) in Civil Engineering from the Trivandrum Engineering College (TEC), University of Kerala in 1961, graduating first rank with distinction and winning the University Gold Medal (Getting it from the then Kerala Governor Sri. V.V. Giri).

His hobbies are reading general books and watching sport competitions.

By that time, the Government of India (GoI) started a new Scheme of Technical Teachers Training Program. The purpose was to attract young bright engineers for teaching. Er. Ganapathy applied for this program from Trivandrum, went for an Interview at New Delhi and was selected in this scheme. It was a 3 year program with first 2 years, part-time teaching and 3rd year attending classes and thus obtained M.Sc. (Engineering) in Structural Engineering at the College of Engineering, Guindy (University of Madras) in 1963.

At the end of 3 years, the Government of India was supposed to appoint them as Lecturers, but was not successful to providing jobs. Hence, he responded to an advertisement from the Indian Institute of Technology for the post of lecturer. Prof. G.S. Ramasamy, the then Director of SERC, who was in the interview committee and is an expert on shell structures, asked questions about shell structures. As Er. Ganapathy's M.Sc. (Engg.) thesis was also on shell structures, he replied those questions creditably. Prof. Ramasamy was impressed with his performance and selected him. Thus, Er. Ganapathy joined the Civil Engineering Department of IITM in September 1964 as lecturer. It is interesting to note that many of his friends from Trivandrum Engineering College, like Prof. Nainan P. Kurian, also joined IIT Madras. Er. Ganapathy's brilliance and passion led him to a long and fruitful association with IIT Madras, becoming as Assistant Professor of Civil Engineering in 1973. Then he went to Germany as an Alexander Humboldt Fellow in 1977, a new Ocean Engineering Centre was formed at IITM and Prof. Ganapathy became a Professor in that Centre in 1978, and later the head of the department. He has established the Department with all modern equipment to carry out research and consultancy works, and retired after working there for 18 years.

At the request of the then permanent head of the department, Prof. P.C. Varghese, he took training in Hindustan Shipyard for 6 months. This helped him to know about ship building and also analysis and design of ship structures. This also helped him to take classes to the Naval Architecture students on ship structure analysis and design.

ADVANCED RESEARCH AND INTERNATIONAL RECOGNITION

Prof. Ganapathy's research acumen earned him coveted international scholarships and fellowships. In 1969–71, he was awarded the DAAD Fellowship to conduct research at the Technical University of Berlin, Germany, and worked with Prof. Karlheinz Roik. He earned his Ph.D. in Civil Engineering from IIT Madras in 1973, under the guidance of Prof. P.C. Varghese, who is a well known professor and author of several books in structural Engineering. Further recognition came with the prestigious Alexander von Humboldt Research Fellowship, which he held twice (Ruhr University Bochum, 1977–78, working with Prof. Karlheinz Roik, who was an expert on composite construction and was instrumental in developing Eurocode 4, in and TU Hamburg-Harburg during 1992, with Prof. Mahrenholtz. He has worked and participated in Research on Offshore structures with Prof Kokkinowrachos of Aachen University for six months. These international stints exposed him to advanced research environments and global challenges in offshore and marine engineering, which he would later adapt and implement in the Indian context.

IIT MADRAS AND OCEAN ENGINEERING LEGACY

In 1978, Prof. Ganapathy joined the newly created Ocean Engineering Centre (OEC), which later became as a full fledged Department at IIT Madras, where he would shape its future over two decades. As Head of the Ocean Engineering Department (OED) (1982–86), he was instrumental in establishing cutting-edge laboratory infrastructure and developing a robust academic and research program in offshore structures, wave mechanics, and marine structural analysis. During his time as the head of the Ocean Engineering Department , he gave complete freedom to the faculty members. He was engaged in several consultancy and Sponsored research projects. He visited the Danish Hydraulic Institute in order to study and implement many laboratory facilities in the OED, under the German aid program. He was also instrumental to bring degree programs in the OED. He also acted as the Chairperson of the Engineering Unit of IIT, Madras during 1993-1996. Prof. Ganapathy retired from IITM in 1997.

He guided 15 Ph.D. theses, several M.S. and M.Tech. Dissertations, and contributed to numerous sponsored research and consultancy projects. His work on steel frame folded plate roofs, stress concentration in tubular joints, structural integrity monitoring of offshore platforms, and lightweight concrete using oil palm shell aggregates are widely cited and respected.

When he retired from IITM, a National Seminar on Recent Trends in Concrete and Steel Structures, was organized at IIT, Chennai, in April 1997 To honor both Prof. C. Ganapathy and Prof. P.S. Rao by their respective Ph.D. students Dr. N. Subramanian and Dr. K. Ganesh Babu, who also edited the Seminar proceedings.

Academic Impact and Global Engagement

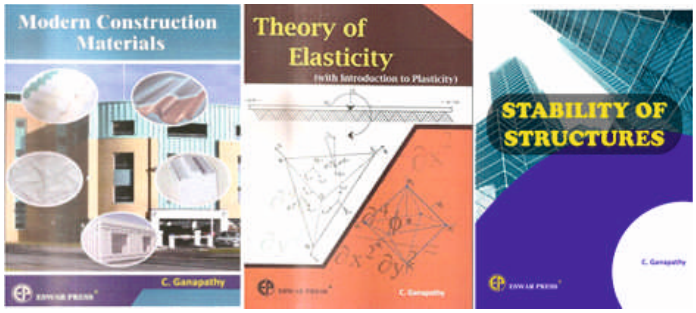
Prof. Ganapathy's academic career extended beyond India- from 1997 to 2002, he served as a Professor and Visiting Professor at multiple Malaysian universities, including University Sains Malaysia, University Malaysia Sabah, and University Technology PETRONAS. His efforts helped to elevate structural engineering education and research in Southeast Asia, particularly in offshore engineering and sustainable construction materials. He also worked in the SXC College of Engineering Kannyakumari District, Tamil Nadu, as Emeritus Professor from 2002.

BOOKS AND RESEARCH PUBLICATIONS

He has authored 3 books and authored or co-authored over 60 international journal papers and dozens of international conference papers, showcasing his versatile interests from marine structural stability, nonlinear analysis, fatigue and fracture mechanics, to neural network applications in structural health monitoring.

- Ganapathy, C. (2015) Modern Construction Materials, Eswar Press, 251 pp. 978 8178740966

- Ganapathy, C. (2017) Theory of Elasticity (with introduction to Plasticity), Eswar Press, 164 pp. ISBN 13: 978-8178740980
- Ganapathy, C. (2023) Stability of Structures, Eswar Press, 234 pp, ISBN-13 : 978 -8195988839



NOTABLE PUBLICATIONS AND RESEARCH THEMES

Some of Prof. Ganapathy's most recognized research contributions include:

- Steel frame folded plate roofs (with Dr. N. Subramanian)
- Stress and strain concentration in tubular joints for offshore structures (with Prof. R.Sundaravadivelu)
- Modal analysis and dynamic monitoring of fixed offshore platforms
- Use of Oil Palm Shell (OPS) as a lightweight aggregate for sustainable concrete
- Nonlinear dynamic response of articulated towers and floating systems
- Wave force simulation and analysis of submerged and moored marine structures

His collaborative works on OPS concrete, published in Cement and Concrete Research, Building and Environment, and Construction and Building Materials, have received international recognition for promoting sustainable use of agricultural waste in construction.

MENTORSHIP AND TECHNICAL LEADERSHIP

Prof. Ganapathy's influence extends through his students, many of whom hold senior positions in academia, research, and industry. Dr.N. Subramanian, his first Ph.D. student is a recognized author of several Structural Engineering books and a successful structural engineering consultant. Prof. Ganapathy's co-guidance in interdisciplinary projects and his technical mentoring have resulted in successful outcomes in advanced structural analysis and marine system design. He guided Dr. R Sundaravadivelu on "Stress concentration on tubular Joints" and has completed many consultation projects like construction of the Gopalpur Port and others along with him.

He has been actively involved in participating in international conferences including OTC Houston, PACOMS Seoul, ICOE, and many IABSE and ASME conferences. His cross-disciplinary approach and technical depth enabled him to collaborate globally across institutions in Germany and Malaysia.

CONTINUING EXCELLENCE AND COMMUNITY CONTRIBUTIONS

Even after his retirement from IIT Madras in 1997, Prof. Ganapathy remained active in academia. Since 2002, he has been serving as Emeritus Professor in the Civil Engineering Department at St. Xavier's Catholic College of Engineering, Nagercoil, Tamil Nadu. He continues to be involved in mentoring, academic reviews, and research promotion.

A lifelong learner and dedicated educator, Prof. Ganapathy also played a key role in introducing innovative practices in structural health monitoring using neural networks, hybrid FEM elements for wave interaction, and performance-based design in offshore engineering.

RECOGNITION AND LEGACY

Prof. Ganapathy's legacy is defined not only by his technical contributions but also by his vision, humility, and dedication to the next generation of engineers. As a teacher, innovator, and international scholar, he has significantly shaped the field of offshore structural engineering in India and abroad. His ability to adapt fundamental structural mechanics to modern challenges in sustainability, ocean resources, and smart systems reflects the breadth of his engineering intellect. Today, his contributions to research in recycled materials,

offshore platforms, and folded plate structures stand as enduring references in their respective domains. Recognizing the contributions made by Prof. C. Ganapathy, The Ocean Engineering Center of the Indian Institute of Technology, Madras instituted a Chair in the name of Prof. C. Ganapathy in March 2023.

Prof. C. Ganapathy truly exemplifies the spirit of a GEM of Structural Engineering — combining scholarship, service, and international engagement in a career that continues to inspire engineers across generations and geographies.

FAMILY

Prof. Ganapathy is married and has a daughter Dr. G. Muthu Shoba Mohan, who is the author of the book Principles of Architecture, Oxford University Press, New Delhi. She is married to Dr. Thiraviam Mohan and has two sons. Dr Thiraviam Mohan is an active Member in Indian Medical Association (IMA) Nageercoil and is becoming State secretary of IMA. The elder grandson is employed in the Firm Infosys and the younger grandson is studying M.D. in General Medicine .



Prof. Ganapathy with his daughter and two grandsons

References

https://www.youtube.com/watch?reload=9&v=oiFSbj-ydh0

About the Author



Dr. N. Subramanian,
Ph.D., FNAE,
is an award-winning Author, Structural Engineering consultant, and Mentor, currently based in Maryland, USA, with over 48 years of experience in Industry (including consultancy, research, and teaching). He was awarded the 2024 Edmund Friedman Professional Recognition Award of the American Society of Civil Engineers, ACCE(I)'s Gourav Award, ICI's 'Lifetime Achievement Award', and many other awards for his contributions towards Structural Engineering. He is the author of 25 books and over 340 papers, including the famous books on 'Design of Steel Structures', 'Design of RC Structures', 'Principles of Space Structures', and the recent 'Building Materials, Testing and Sustainability' (email - drnsmani@yahoo.com)

WINTERBERRY TOWER AND PLAZA
- Structural Adaptability in Practice

By - Faisal Chogle

Winterberry Tower and Plaza is a compact mixed-use tower located within Nahar's Amrit Shakti Township, comprising a commercial ground floor, five parking levels (with a mix of individual and stack parking systems), eight residential floors, and an amenity terrace featuring a swimming pool. The building footprint measures 55.65 m × 13.25 m.



Responding to Mid-Construction FSI Revisions

The project faced a key structural challenge when additional FSI was sanctioned mid-construction—after all isolated footings were already cast. This required the design team to revise structural and architectural layouts without disrupting the ongoing foundation works.

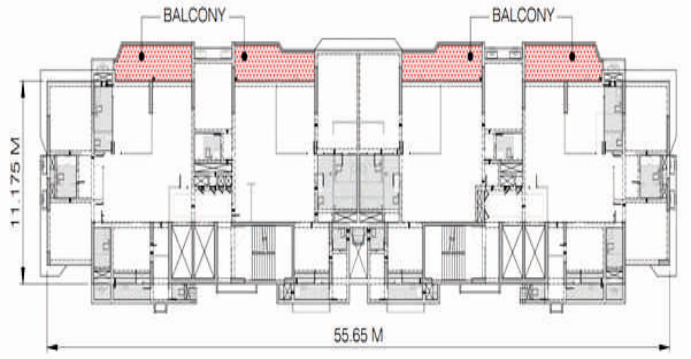
Fortunately, the team at Sterling had anticipated such a scenario. The original foundation design included provisions for one additional floor and high terrace loading. This foresight enabled the increased superstructure loads to be safely carried by the existing foundations—avoiding expensive rework and delays.

Cantilever Design for Expanded Parking and Fire Access

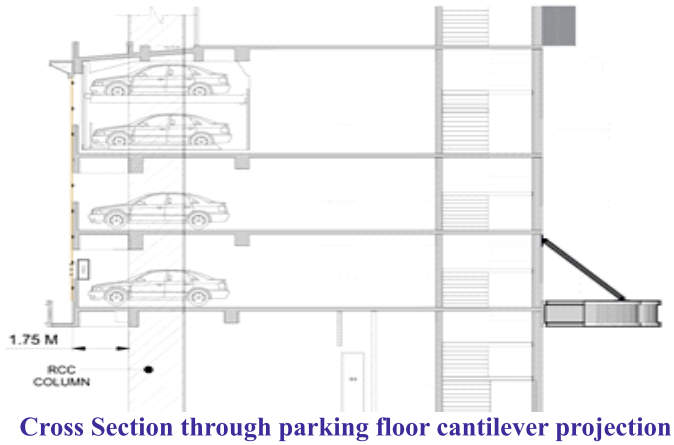
The revised FSI was primarily allocated to the parking levels, widening the building from 13.25 m to 17.3 m. This was achieved through long-span cantilevered slabs, designed to project beyond the original footprint.

The typical floor plan provided highlights these cantilevered zones. Structurally, the cantilevers were optimized to limit deflection and ensure serviceability under parking loads. Functionally, they serve a dual role by creating clear column-free margins at ground level, ensuring compliant fire-tender access on site.

The building section drawing clearly illustrates the cantilevered projection and the resulting clear height area at the ground floor—a direct outcome of integrating structural engineering with fire safety and site planning needs.



Typical Residential Building Plan



Cross Section through parking floor cantilever projection

Given the site's open surroundings, open excavation with isolated footings was used—a cost-effective and site-friendly foundation solution well-suited to the soil profile and modular column grid.

Winterberry Tower and Plaza exemplifies proactive, context-sensitive structural design. The ability to seamlessly adapt to revised FSI requirements —without altering foundational works—was made possible through early planning and responsive engineering. The project showcases how structural ingenuity can directly support architectural vision and regulatory compliance in high-density urban developments.

Credited : Part of Nahar's Amrit Shakti Township | Architect: Hafeez Contractor | Structural Consultants: Sterling Engineering Consultancy Services Pvt. Ltd.



About the Author
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faisalchogle@sterlingengg.com

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RIDING QUALITY OF INDIAN ROADS – FROM A STRUCTURAL ENGINEER'S PERSPECTIVE

By - Er. Vivek Abhyankar

Abstract : Highway or Roads' engineering is a one of the important branches of the Transportation sector. Operating efficiency of any Road stretch depends on - (a) its geometric features (viz. curves; gradients – longitudinal & cross; clearances – along width & heights; surface and subsurface drainage; signages and positions of structures; street lighting, roadside arboriculture), (b) quality of pavement construction (viz. rigid, flexible, number of joints, safety / speed barriers etc.) and (c) safety of structures. These three aspects are mainly looked after by (a) Highway engineers, (b) Execution engineers and (c) Structural / bridge designers, respectively. We know, if any road has a sharp gradient / curves / super elevation / blind spots etc. then it affects the road operations, as well as if it has potholes / cracks or settlement in pavements / unevenness or even extra smoothness then again affects the road quality. In the same way, it is well-established now that if the bridges have more expansions joints, then they affect the riding quality of that road stretch (and intern the operating efficiency & safety, also). Hence attempts shall be made by designers to minimize the number of expansion joints within a bridge length to facilitate better riding quality. There are several national / international specifications / practices available which emphasize and enable reducing the numbers of expansion joints in bridge superstructures.

In the current paper, the author has briefly described why the expansions joints are required; why bridge designers are comfortable with the simply supported spans and how it affects the riding quality of a road. Further, the paper covers, various techniques / structural forms, which enable reduction in numbers of expansion joints – and resulting benefits of the same.

Key words : Expansion Joints (EJs); Deck continuity (DC); Integral bridges; redundancy (indeterminacy); fuel consumption; riding discomfort; vehicle speeds; jerks at EJs; vehicle skidding / blowing; PT (post tensioning); Elevated corridors (EC)

Introduction : Structural analysis and design of a simply supported slab / beam / bridge girder is simple, time saving and always preferred by structural designers since past several years. It does not involve complex formulae or even does not require any advance analysis software programs for secondary effects / higher order analysis / structural indeterminacy; it can be done with simple handwritten manual-calculations / spreadsheets. The resulting structural forms and details (viz. reinforcements and PT details in case of RCC / PSC bridges; and welds / bolts / rivets / stiffeners etc. in case of steel bridges) are also simple. After design / drawing is complete the approvals happen very fast due to simplicity of structural form and later construction is also simple (span-by-span)'.

What is mentioned in the above paragraph is an age-old practice and preference of several engineers (in design offices or even at construction sites). But when we use 'Expansion Joints' (called as simply EJ in this paper ahead) to connect two simply supported spans with each other – the problem crips in. Readers should note here clearly that this is not the problem with the physical body of 'EJ' but with the

installation limitations' (workmanship). EJ can never be fixed with 'zero' error (or 100% accuracy) in the level; a minor error in elevation difference can cause a great amount of jerks to a vehicle riding over it with a higher speed! More is the speed, more is the jerking discomfort experienced by the wheels and by the overall car body. If a vehicle is riding at a high speed (say 80kmph or more) then in rare cases a driver may even lose control over the vehicle due to sudden jerk experienced at expansion joint location. 'But this doesn't mean that one should ride a vehicle at a lower speed', because it would defeat the whole purpose of rapid transportation systems; and, even if vehicle is driven with slower speed the vehicles (although may not skid at EJ) still experience driving discomfort at the EJ locations and traffic congestion behind the said patch of road. Thus, we can say - 'The more the number of closely spaced EJs, the more is the driving discomfort!' Often, in mega expressway / highway projects crossing long rivers or the canals / elevated corridors / long approaches of ROBs etc. there may be a series of bridge spans in one single structure; if all are designed as simply supported (merely for the ease of design and construction) then it would leads to several number of joints causing riding discomfort.

(N.B:- When compared with roads, in railway / metro or monorail projects the train body travels on steel rails (which his supported over closely spaced sleepers / planks) and not directly on the continuous deck surface (like roads), so the presence of EJ at every span does not cause any difficulty to the riding comfort for railway / metro / mono.

Apart from the riding discomfort caused by (even) properly installed EJs and several EJs installed in a series, the faulty installation of EJs cause further discomfort. A few images of such defective EJs can be seen below in Fig.1 ahead. As per increasing age of the bridge and original quality of construction the bridges experience shrinkage / creep / settlement of supports etc. In simply supported bridge configuration, there may be a sudden kink experienced at EJ line (instead of gradual distribution of settlement / faults over a larger part of the bridge length).

In busy metro cities like Delhi, Kolkata, Mumbai, Chennai or others; on several bridges we find thick wearing coat of bitumen laid on the top of existing / original damaged layer due to lack of repair time. At a few places we even find 'concrete paver blocks' placed on bridge as a wearing coat which completely takes a toll on riding quality over full bridge length!



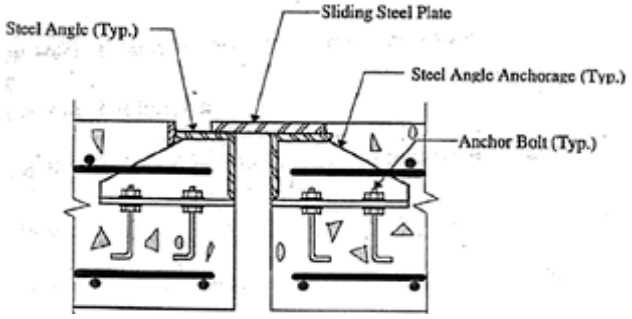




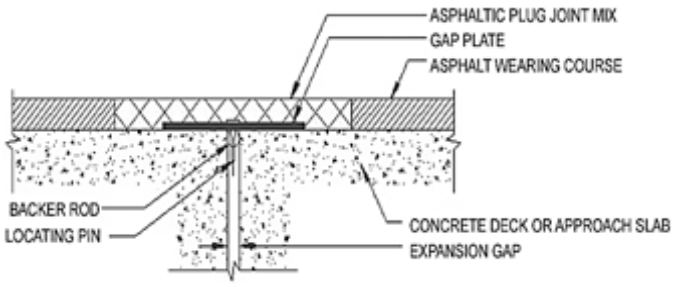
Fig.1 – Shows various failure modes of bridge expansion joints.

Thus, in modern day bridge designs, the entire focus is kept on the elimination or minimizing the number of EJs on any bridge stretch. Still many Indian bridge designers are found to be reluctant to adopt this practice (merely for personal ease, without bothering about overall professional service to society, at large!). In the foregoing discussion various ways and means to restrict the number of EJs are presented along with various national (MORTH / IRC) and international provisions / standards.

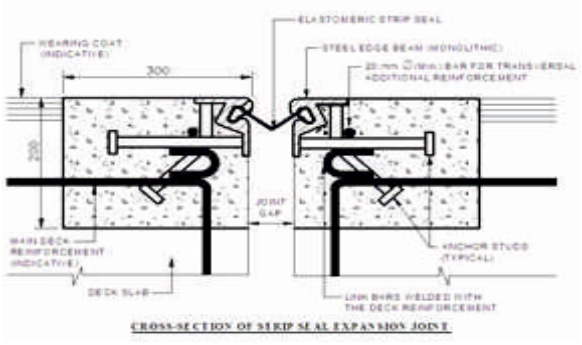
Necessity of Expansion Joints & their types : Bridge superstructures (concrete / steel composite or any material & any configuration viz. slab, girders, truss, arch, cabled etc.) experiences thermal expansion or contraction due to daily (diurnal) and seasonal temperature variations over year. In city like Delhi where the minimum temperature recorded in past 50 years was 5°celcius in winters and highest as 47°celcius in summers. Thus, the thermal gradient of about 42°celcius (i.e. 47°-5°c). Considering a concrete bridge of typical 7 spans x 25m length, the thermal movement per single span is = L x □ x □T = (25,0000mm) x (1.2x10-5/°c) x (42°c) = 8.75mm. If all the spans are made continuous then the cumulative movement of all spans together would be 7 x 12.25 = 61.25mm. Thermal movements upto 80mm can be accommodated using 'strip seal' type EJs and thermal movements of greater magnitudes will be catered using 'modular type' of EJ. In certain cases, where the spans are smaller in length as well as numbers viz. a 1 x 10m RCC slab the expected thermal movements are very small (merely 3 to 5mm) in such cases simply compressible / bituminous seal is provided between two spans. Fig.2 ahead shows various types of EJs for small / medium and large movements of superstructure / deck.



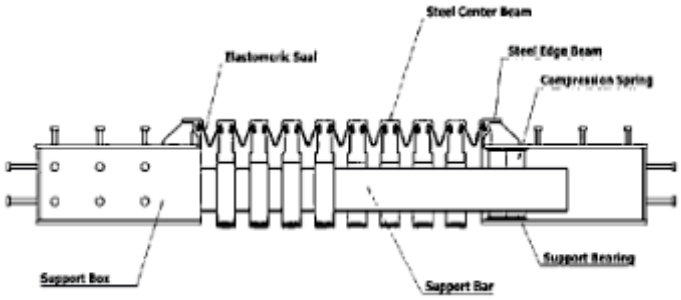
sliding plate type EJ;



Asphaltic plug type EJ – both for smaller deck movements



Strip seal type EJ for medium movements;



Modular type EJ for larger deck movements
Fig.2 – showing various types of EJs for small / medium and large movements of superstructure / deck.

Generally, the EJs described above are installed at pier locations or at articulation location in balance cantilever spans, in perpendicular direction to the traffic; these are called as 'perpendicular / transverse or conventional Expansion Joints'. In certain cases (like up/down ramps / loops / branches etc.) an extra carriageway meets or emerges out from the main elevated corridor / carriageway; at such locations 'a longitudinal EJ' is also required. Longitudinal EJ is also required while widening the existing bridge deck width. In present paper, author has dealt with only perpendicular EJs at pier locations.

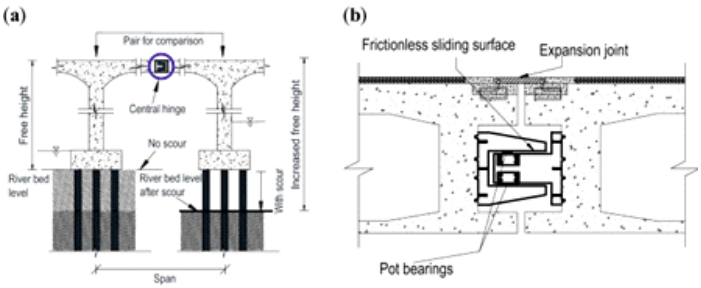


Fig.3 – showing perpendicular EJs at articulation in balanced cantilever bridge.

Continuity of Bridge decks :- This is the only solution available as on date to maintain the better riding standards on the road bridges. As per expressway manuals as four-lane manual of IRC the minimum prescribed spacing of EJs is 200m or more (thus imagine if we have 25m of a typical span, then each continuous module will have 25m x 8nos. of spans). Apart from the riding quality, another benefit of such continuous span module is distribution or the sharing of lateral forces in larger numbers of piers (or the portal action). But, in such long modules lot of thermal stresses are generated which shall be relieved by giving proper 'Free' / sliding bearings over piers and one fixed pier for overall stability of the module or shall be sustained by adequately designed extra reinforcements.

This can be done using two options :- 1) Continuous superstructure or 2) Integral bridges.

1) In first option - the superstructure is kept continuous and supported over bearings; the bearings require larger movements and if post-tensioning is used then PT cables often require couplers to cater for the longer length of the module. To cater for the large movement of span spherical and pot-ptfe bearings are needed to support the superstructure; this may delay the project duration if the supply of bearings is delayed. Also, the errors in fixing of the bearings (especially on a curved alignment) shall be controlled carefully.

2) In second option - the individual spans / girders, may be cast as simply supported and later the rebars projecting from girders and piers are lapped and cast monolithically to form a cohesive integral structure. Thus, in integral structure bearings can be fully eliminated. In some cases of integral structures, the bearings on outer extreme piers are not eliminated – such modules are called as 'semi-integral' type bridges. Many a times construction professionals do

not like integral bridges due to congestion of rebars above pier-cap locations and the temporary supports / cribs / towers required to support the girders during construction stages (but this problem can be eliminated by providing extra width / corbel from the pier-caps). Here, readers must understand one limitation of 'integral' bridge configuration is – in acute skew angle in plan (more than 30 to 45 degree) integral bridges may not function well!

To resolve the above limitations of above two, as wells as to avail the design and construction ease, what option available is simply supported girders on elastomeric bearings with deck slab continuity. This is very close to simply supported spans but has better riding quality. (Above three types of bridge configurations are illustrated below).

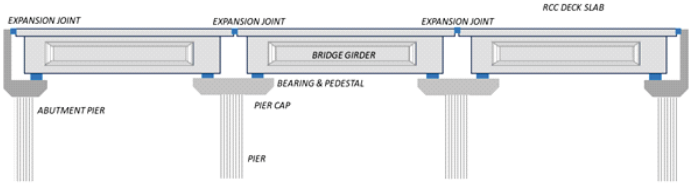


Fig.4 – Typical Simply supported Bridge Girders over bearings and deck slab connected using 'EJ' – this option is being followed by many designers although not recommended and indirectly prohibited by codes.

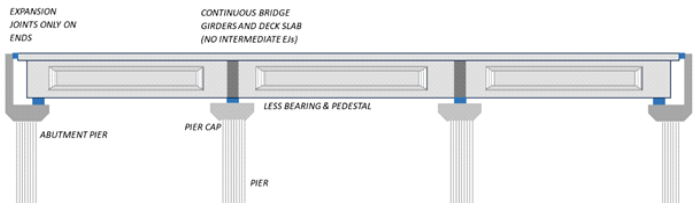


Fig.5 – Typical Continuous Super-Structure supported on bearings – no intermediate 'EJs' required. (in figure.3 above the continuity can be given either through girders or diaphragms)

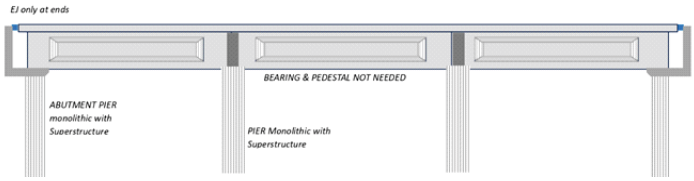


Fig.6 – Typical 3-span INTEGRAL bridge module (no intermediate EJs are needed).

As an alternative to Fully integral bridge configuration, in some cases a semi-integral configuration is also preferred (as shown in Fig.7 and 8 ahead)

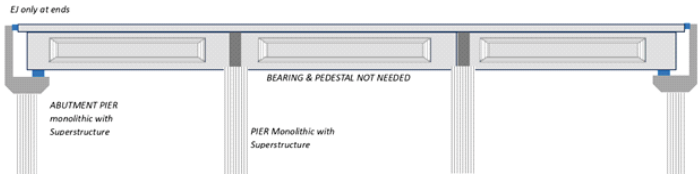


Fig.7 – Semi-Integral Bridge module (option-1 outer supports has bearings)



Fig.8 – Semi-Integral Bridge module (option-2 Inner supports has bearings)

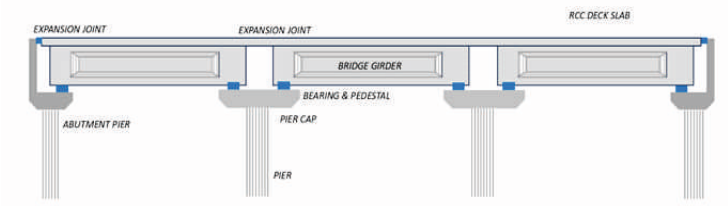


Fig.9 – Simply supported girders on bearings with deck continuity

In case of simply supported bridges, in case of differential settlement of a pier foundation often a sudden kink in the alignment is experienced at the EJ location; whereas in the case of continuous / integral bridges there is no such sudden kink observed (i.e. the effect of local deformations get distributed, uniformly, over a smaller length of structure) – but it must be noted that due to this effect additional amount of reinforcement is needed in continuous and integral bridges.

Indian code specifications : As per IRC-SP 99-2013 (expressway manual) clause number 6.8 clearly prescribes as – "Structures shall have minimum number of expansion joints. This may be achieved by adopting longer spans, making the superstructure continuous or by adopting integrated

structures. Expansion joints shall conform to IRC:SP:69. In any case, the number of expansion joints shall not be more than 1 for each 100m length of the bridge or part thereof. For avoidance of doubt, the structures upto 100m length shall have only one joint at one side abutment, the structures over 100m and upto 200m length may have two joints and structures over 200m and upto 300m length may have maximum 3 expansion joints.

ii) The Concessionaire shall furnish guarantee/ proprietary indemnity bonds from the manufacturers / suppliers of expansion joints requiring no-replacement for a period of 10years".

IRC-SP 73-2018 (two Lanning manual), IRC:SP:84-2019 (four Lanning manual) and IRC:SP:87-2019 (six Lanning manual) clause number 7.13 in all these three, recommends - "Structures shall have minimum number of expansion joints. This may be achieved by adopting longer spans, making the superstructure continuous or by adopting integrated structures."

In spite of this, several Indian structural engineers (bridge designers) are reluctant to explore the continuous / integral or deck continuity options!

Maintenance, Repair & Replacement of EJ : The main superstructure / substructure & foundation of a bridge are designed for 100yrs life as per IRC-112 guidelines; whereas the life of EJ is only ten years and life of bearings is about 30years; thus during complete life cycle of any bridge the EJ replacement is required to be done minimum 09 times and bearings replacement is required to be done minimum 02 times – which is a laborious task in itself.

Apart from this, the regular maintenance of EJs and bearings is a challenge. Often dust, soil, vehicle oils, rainwater splash on EJs and sometimes accumulate which has to be frequently removed; regular brooming of EJs may be required to remove grit particles. But on busy expressways / ECs, such regular maintenance of EJs is not possible (otherwise the road traffic will have to be halted!).

During service life of EJ, sometimes the adjacent concrete may get damaged and had to be repaired locally; sometimes the moving parts or the rubber sheet has to be repaired / replaced.

Often the bearings designer prescribe 'pre-setting' for various classes of bearings (fixed / free / guided) on various piers as per span configuration and the curvatures & gradients etc. whereas the values of expansion / contraction specified by the vendors for EJs are not found to be coherent with the bearing movements; in addition the surveyors may give wrong coordinates to construction team – in such cases, often, both (the bearings and expansion joints) get locked and non-functional.

Other Aspects governing riding quality of a Road : Expansion joints is a main aspect from 'structures discipline' which affect the riding quality of a road surface; main aim of present paper is to discuss the same. However, it may be noted that apart from EJs there are several more aspects those affect the riding quality (as briefly listed below with a few photographs); but as stated at the beginning the focus of present paper is limited to structures domain only; merely to complete the discussion on riding quality of roads other aspects are listed down here which can be studied by readers separately.



severe 'potholes' on roads after rainy season



blind curve



Dug-up roads for utility construction



slums near busy road.

Fig.10 – Various other causes (other than structures) which reduce riding comfort



Stray cattle rooming on roads in search of water and food.



(Left) trees fallen on roads during rainy season

Conclusions : From the discussion till now it may be clear that closely spaced 'perpendicular' Expansion joints in any stretch of bridge, leads to poor riding quality; an attempt shall be made by the designers to almost eliminate or at least reduce the number of Expansion joints in any of the bridges / elevated corridors; recommended spacing of the EJs is 100m to 200m. to eliminate internal EJs one may try to use 'deck / diaphragm continuity' or the integral bridge configuration. Installation, maintenance & repair, replacement of EJs is equally laborious tasks. The design and selection of EJs shall be done carefully in sync with the actual superstructure & bearing movements.

References :

1) IRC:SP:66-2016 - Guidelines for Design of Continuous Bridges (First Revision)
2) IRC:SP:69-2011 Guidelines & Specifications for Expansion Joints.
3) IRC:SP:115-2018 Guidelines for Design of Integral Bridges.
4) IRC:SP-99-2013 Manual of Specifications and Standards for Expressways`
5) IRC:SP:73-2015 Manual of Specifications & Standards for Two Lanning of Highways with Paved Shoulders"
6) IRC:SP-84-2014 Manual for Specifications & Standards for Four Lanning of Highways thr PPP.
7) IRC:SP-87-2013 Manual of Specification & Standards for Six Lanning of Highways thr PPP.
8) IRC-83 (part 1 to 4) – on bridge bearings.

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CAPACITY DESIGN OF BEAMS IN THE LATERAL LOAD RESISTING SYSTEM

By Ashish Bhangle

Key message

Capacity design is not a software design option, a 100 mm stirrup-spacing rule, or another load combination. It is a hierarchy-of-strength philosophy intended to ensure that ductile flexural mechanisms can develop before brittle shear failure.

In reinforced-concrete buildings designed for seismic resistance, the design of beams participating in the lateral load resisting system cannot stop at the member forces reported by an analysis program. This is particularly important for moment-frame beams and coupling beams, because the seismic design intent is not merely to satisfy a reduced elastic force demand. It is to ensure a rational sequence of yielding and to prevent brittle modes from controlling the response.

The issue becomes especially important in tall buildings. Wind often governs the flexural reinforcement of beams, while earthquake loading governs the ductility philosophy. If the capacity-design check is then performed using only the earthquake end moments reported by ETABS, the designer may ignore a substantial part of the flexural strength that has actually been built into the member.

1. Demand is not capacity

A conventional analysis answers the question: what forces are obtained for the adopted load combinations and analysis assumptions? Capacity design asks a different question: if the member develops the strength that it actually possesses, what forces can then be transmitted to the associated brittle mechanisms?

For a beam forming part of a ductile seismic system, the longitudinal reinforcement at the two ends establishes the available flexural resistance. The corresponding capacity-design shear is therefore related to the end moment resistances based on the reinforcement actually provided, together with the appropriate gravity-load contribution and the sign combinations prescribed by the governing code.

Vcap ≈ (MR,L + MR,R) / L +
applicable gravity-load shear

This is fundamentally different from calculating a so-called sway or reverse shear only from the elastic earthquake end moments. The latter remains an analysis-demand calculation; it does not necessarily represent the force that can accompany development of the member strength.

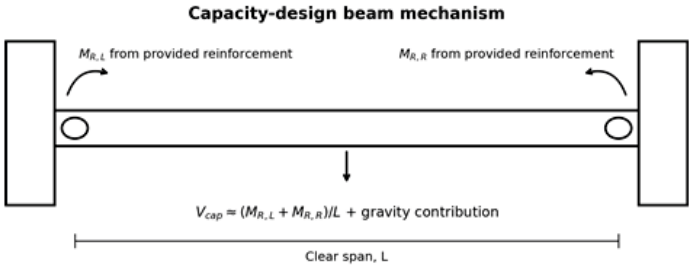


Figure 1. Capacity-design concept for a beam: the shear check is tied to the moment resistance that can be developed at the beam ends.

2. Tall buildings: wind may govern reinforcement, but reinforcement governs capacity

Consider a tall building in which the beam end moments from wind combinations are higher than those from earthquake analysis. The required longitudinal steel may then be controlled by wind. Once that reinforcement is provided, however, it is the physical property of the member. The beam does not possess one flexural capacity under wind and a smaller capacity under earthquake.

This is the point at which a common office shortcut becomes unsafe: reinforcement is selected from the governing wind combinations, but the capacity-design shear is still calculated from the smaller earthquake end moments. The increased flexural strength created by the wind-governed steel is thereby ignored.

ELASTIC EQ MOMENTS	PROVIDED-STEEL CAPACITY
ME = 300 kNm at each end	MR = 600 kNm at each end
L = 5.0 m	L = 5.0 m
VEQ = (300 + 300) / 5 = 120 kN	Vcap = (600 + 600) / 5 = 240 kN

Illustrative example - before adding the applicable gravity contribution and code-specific factors.

The example is intentionally simple, but the implication is important: the shear associated with the strength actually available in the member can be much larger than that inferred from the reduced earthquake-analysis moments alone.

A useful one-line rule

Wind may govern reinforcement, but the reinforcement governs the capacity.

3. Why the severe earthquake argument matters

Indian seismic design, like other modern force-based seismic codes, uses reduced design forces on the expectation that appropriately detailed structures will undergo controlled inelastic response during strong shaking. For conceptual discussion, engineers sometimes compare the unreduced severe-earthquake force level with the reduced design level and note that the ratio can be of the order of 2R when moving from a design-basis level to an MCE-level elastic comparison. That is useful for understanding why the reduced elastic member forces cannot be treated as an upper bound.

However, 2R should not be used as a literal universal multiplier on every member force. Actual response is influenced by overstrength, redistribution, modal effects, period elongation, nonlinear behaviour and the specific scaling provisions of the adopted code. The capacity-design check avoids this uncertainty in a more rational way: it protects brittle actions against forces associated with the strength that the intended ductile mechanism can actually develop.

Capacity-design question

If the beam develops the flexural strength associated with the reinforcement that has actually been provided, can it sustain the corresponding shear without a brittle failure?

4. Minimum ductile detailing is not capacity design

A second misunderstanding is to equate compliance with the minimum transverse-reinforcement detailing rules of IS 13920 with completion of capacity design. Close link spacing near beam ends is essential, but it does not answer the first and more fundamental question: what shear resistance is required when the beam-end flexural strengths are mobilised?

The provisions commonly associated with close links over the beam end regions - often leading to a practical spacing of 100 mm or less - are detailing limits. The capacity-design shear calculation and the detailing limits are complementary requirements, not alternatives.

Required resistance → calculated from capacity mechanism

Reinforcement arrangement → must also satisfy ductile detailing limits

A beam can therefore satisfy the prescribed maximum stirrup spacing and still be inadequate for the calculated capacity-design shear. Conversely, merely increasing stirrup spacing efficiency does not correct an inconsistent global model. Strength, detailing and modelling all have to be coherent

5. When a beam fails capacity design after the global design is frozen

A recurring practical problem appears late in design. A beam is initially modelled as an integral part of the lateral system; its stiffness contributes to the analysis; wall, column and foundation forces are obtained; and drawings may even be issued. During detailed beam design, the member then fails its capacity-design shear check. The temptation is to solve the local failure by changing the model rather than addressing the structural consequence.

Typical changes include releasing the beam ends, applying a much smaller stiffness modifier, overwriting the member as an ordinary beam, or otherwise excluding it from the ductile design checks. None of these modelling choices is inherently wrong. They may be entirely appropriate if they represent the intended physical behaviour of the building. The issue is one of consistency and timing.

If the beam is intended to be released or substantially softened, that decision should be part of the final global model before shear-wall, column and foundation designs are finalised. A change in beam stiffness or connectivity can redistribute lateral forces, alter drift and torsion, change wall moments and axial forces, and modify raft, pile or foundation reactions.

Modelling principle

A release or stiffness modifier is a valid engineering assumption when it is part of the model on which the complete structure is designed. If it is introduced only after a member fails, the affected global system must be reanalysed and rechecked.

6. Coupling beams: the modelling label does not change the behavior

The same philosophy is even more important for coupling beams between structural wall piers. A coupling beam is not simply a strip of wall above an opening. It transfers forces between adjacent wall piers, restrains their relative rotation, and develops significant cyclic shear and end moments. Those beam shears generate opposing axial forces in the wall piers and contribute to the overall overturning resistance of the coupled-wall system.

MOT = contribution of individual walls + contribution from coupling action

Accordingly, a large coupling-beam shear is not automatically a modelling error. It may be the direct consequence of effective coupling. If the beam stiffness is being used to reduce drift, alter wall-force distribution or enhance overturning resistance, the resulting beam forces are part of the same structural mechanism.

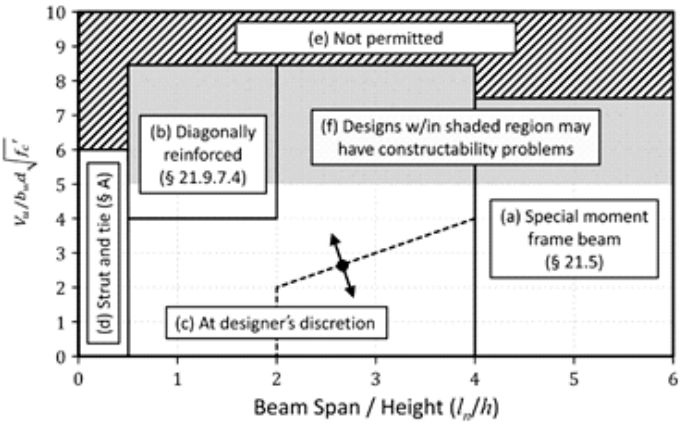


Figure 5-11 – Seismic coupling beam design space.

Figure 2. Conceptual coupling-beam design space, redrawn from the behavioral concept illustrated in NEHRP/NIST Technical Brief No. 6.

The NEHRP/NIST guidance usefully shows that coupling-beam behavior changes with aspect ratio and shear demand. Relatively slender beams may be treated more like special moment-frame beams; shorter and more highly sheared members move into regions where diagonal reinforcement or other special design approaches become important. Very low aspect-ratio regions can behave as disturbed regions rather than conventional flexural beams.

The numerical boundaries in US guidance should not be transplanted into Indian practice without reference to the governing code. The value of the diagram for an Indian designer is conceptual: geometry and shear demand change the mechanism, and the member should be designed according to that mechanism.

7. When capacity-design shear exceeds practical RC limits: detailing alternatives

Once the capacity-design shear has been calculated from the flexural strength actually available at the beam ends, the next question is whether that shear can be resisted by a conventional reinforced-concrete coupling-beam detail. If the required shear stress becomes very high, the answer should not automatically be to keep adding conventional stirrups. At some level of shear demand and for short span-to-depth ratios, the governing behavior changes and a different coupling-beam system may be more appropriate.

The table below summarizes five commonly used coupling-beam forms described in international practice: conventional reinforced-concrete beams, diagonally reinforced beams, structural-steel coupling beams, encased-steel composite beams and embedded-steel-plate composite beams. The table is useful as a design-selection map because it compares span-to-depth applicability, practical shear-stress range, stiffness, constructability, ductility and the ability to distribute shear vertically into the wall boundary region.

Table summary of the five types of coupling beams in RC buildings.

Coupling Beam Type	Code-Specified Maximum Allowable Nominal Shear Stress (Psi)	Applicable Span-To-Depth Ratio	Practical Maximum Shear Stress (Psi)	Suggested Effective Stiffness in Structural Analysis Model	Construction Feasibility	Energy Dissipation Capacity and Ductility	Shear Force Vertical Distribution
Conventional	$10\sqrt{(f_c')}$	$2.0 \le L_n/h$	$4\sqrt{(f_c')}$	$0.35E_cI_g$	Easiest	Poor	No
Diagonally-Reinforced	$10\sqrt{(f_c')}$	$L_n/h \le 1.5\text{-}2.0$	$8.5\sqrt{(f_c')}$	$0.35E_cI_g$	Most Difficult	High	Yes
Steel	N/A	$L_n/h \le 4.0$	N/A	$0.6E_cI_{steel}$	Difficult	High	Yes, max 20%
Encased Steel Composite	N/A	$L_n/h \le 4.0$	N/A	$0.06 \cdot L_n/h \cdot E_cI_{steel}$ ($0.35E_cI_g$ lower bound)	Difficult	High	Yes, max 20%
Embedded Steel Plate Composite	$\approx 18\sqrt{f_c'}$	$1.0 \le L_n/h \le 4.0$	$\approx 18\sqrt{f_c'}$	$0.35E_cI_g$	Medium	Moderate	Yes

Figure 3. Summary of five coupling-beam systems used in RC wall buildings, including indicative shear-stress limits, span-to-depth ranges, stiffness and constructability characteristics.

Important code notes : The stress expressions shown in the table are from US/international coupling-beam literature and use fc' with the original psi-based format. They should not be read as direct IS 13920 limits or converted mechanically into Indian code provisions. For an Indian project, the applicable IS 13920 or IS 456 requirements remain mandatory; alternative steel or composite coupling-beam systems should be designed using an appropriate recognized standard and project-specific acceptance/peer-review procedure where they are outside the explicit scope of the Indian code.

Practical design decision when capacity shear is too high

If a conventional coupling beam exceeds its appropriate shear-stress range, the response should be to change the detailing or the structural solution - for example, diagonal reinforcement, a structural-steel coupling beam, an encased-steel composite beam, an embedded-steel-plate composite beam, or a deliberate change in beam geometry/stiffness and global coupling action. Simply retaining the same conventional RC detail while bypassing the capacity check does not resolve the underlying brittle-failure risk.

For relatively slender coupling beams with moderate shear demand, conventional ductile beam reinforcement may remain practical. As the member becomes shorter and the capacity shear rises, diagonal reinforcement can provide a more direct mechanism for transferring the cyclic shear and can deliver substantially better energy-dissipation behavior. Where diagonal reinforcement becomes excessively congested or difficult to construct, steel or composite coupling-beam solutions provide additional alternatives. These systems can transfer very high shear through embedded steel elements and may be particularly attractive in heavily loaded core walls, although anchorage into the wall, force transfer, local confinement, erection tolerances and fire/corrosion protection require careful detailing.

The key point is that a high capacity-design shear is information about the required structural mechanism. It should trigger a conscious choice of coupling-beam system, not a software overwrite. If the selected beam type or stiffness is changed, the global model should be updated accordingly because coupling stiffness influences wall axial forces, overturning resistance, drift, torsion and foundation demand.

8. Shell, spandrel or pier? The earthquake does not read the ETABS label

Coupling regions are often modelled in ETABS using shell elements. They may be assigned a spandrel label, or in some models may effectively become part of a larger pier assignment. Shell modelling itself is not a problem and can be an excellent way of representing stiffness distribution. The problem begins when the software object type replaces structural judgement.

If a strip of concrete between two wall piers spans across an opening and transfers coupling forces, its physical function remains that of a coupling region whether the program reports it as a frame, spandrel or portion of a pier. The designer still needs to identify the relevant actions - shear, end moments and, where applicable, axial force - and design and detail the region accordingly.

Behavior before label

A coupling beam does not cease to be a coupling beam because it has been modelled with shell elements or included within a pier label. Structural classification should follow behavior and load transfer - not the software object type.

9. Do not take credit for stiffness and then ignore the resulting forces

An internally inconsistent model can arise when a coupling beam is retained with substantial stiffness because that stiffness helps the global analysis - perhaps by reducing drift, coupling adjacent walls or changing overturning-force distribution - but the member is later ignored or artificially softened when its own seismic design becomes difficult.

The design cannot legitimately take the global benefit and discard the local consequence. If the engineer wishes to reduce coupling action, that is a valid structural strategy, but the reduced stiffness or release should be incorporated in the final model and the entire affected system should be checked on that basis.

10. Common misunderstandings and a more consistent approach

Common practice	Why it is misleading	More consistent approach
Capacity shear is calculated from EQ end moments only.	Analysis demand is confused with member strength.	Basing the capacity mechanism on flexural resistance associated with reinforcement actually provided, following the governing code.
Wind governs longitudinal steel, but that extra steel is ignored in seismic capacity design.	The physical strength created by the provided steel is ignored.	Recognize that once provided, the reinforcement contributes to the member capacity during severe seismic response.
100 mm stirrups near beam ends mean capacity design is complete.	Detailing limit is confused with required shear strength.	Calculate the capacity-design shear and also satisfy the ductile detailing limits.
A failing beam is released after wall/foundation drawings are issued.	The local model is changed without revisiting the global load path.	Use the intended release/modifier in the final global model or reanalyze and recheck affected members and foundations.
A beam is overwritten as ordinary because the ductile check fails.	Software classification is used to bypass physical participation.	Classification must reflect the actual lateral-force-resisting behavior.
Coupling region is absorbed into a pier label and ignored.	Object assignment is mistaken for structural behavior.	Extract and design the coupling actions irrespective of whether the region is represented by frame or shell elements.
Coupling-beam stiffness is retained but difficult design forces are disregarded.	Global benefit is retained while local consequence is rejected.	Treat stiffness, strength, detailing and load path consistently in one final model.

11. A practical design workflow

1. Identify whether the beam or coupling region participates materially in the lateral load resisting system.
2. Adopt realistic stiffness assumptions, releases and cracked-section modifiers before the global design is finalized.
3. Complete global analysis and obtain the governing conventional load-combination demands.
4. Design longitudinal reinforcement for the governing flexural demand, which may be controlled by wind, gravity or earthquake combinations.
5. From the reinforcement actually provided, determine the relevant beam-end moment resistance in accordance with the adopted ductile-design code.
6. Calculate capacity-design shear for the appropriate positive and negative sway mechanisms, including the applicable gravity-load contribution.
7. Design transverse reinforcement for the calculated shear and separately satisfy the code detailing limits.
8. For coupling beams, check whether aspect ratio and capacity shear demand permit conventional RC detailing or require diagonal reinforcement, steel, composite, or another explicitly designed coupling-beam system.
9. If a release or stiffness change is subsequently required, rerun the global model and recheck the affected walls, columns, drifts and foundations before drawings are frozen.

Conclusion

Capacity design is best understood as a hierarchy of failure rather than a software check. The intended ductile mechanism should be allowed to form, while brittle mechanisms are protected against the forces that can accompany development of the actual member strength.

For tall buildings, the practical consequence is particularly clear: wind may govern the quantity of beam reinforcement, but once that reinforcement is present it establishes the flexural capacity that can be mobilised during severe earthquake response. Using only the reduced earthquake-analysis moments for the sway-shear calculation can therefore understate the force that the member is capable of transmitting.

Likewise, minimum ductile detailing cannot replace a capacity-strength calculation; a coupling beam cannot be made to disappear by changing its ETABS label; and a release or stiffness modifier introduced after the global design is complete cannot be treated as a purely local correction. The final analytical model, member design, detailing and foundation design must all represent one consistent load path.

Final takeaway

Capacity design means designing for what the structure can actually develop - not merely for what the elastic analysis reports.

References and publication note

1. Bureau of Indian Standards, IS 13920:2016, Ductile Design and Detailing of Reinforced Concrete Structures Subjected to Seismic Forces - Code of Practice.
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3. Moehle, J. et al., NEHRP Seismic Design Technical Brief No. 6: Seismic Design of Cast-in-Place Concrete Special Structural Walls and Coupling Beams - A Guide for Practicing Engineers, NIST GCR 11-917-11.
4. Coupling Beam Types -Practical Reinforced Concrete Building Design by Songtao Liao and Benjamin Pimentel.

About the author



Mr. **Ashish Bhangle** is the Director of Dr. Kelkar Designs Pvt. Ltd. and a structural engineer with over 28 years of experience. He has designed and managed a wide range of residential, commercial, industrial, and high-rise projects, completing more than 500 projects across India and around 100 projects internationally.

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NEWS AND EVENTS DURING JULY– SEPT 2026

by Er. Vatsal Gokani

31 July 2026 : ISSE Indore Centre jointly organizes monthly lecture series with ASE Indore & ACCE, Indore Center and in the same on 31st Jly 2026 Er Anshul Patel, ex Manager, IRCON international Ltd delivered lecture on India's largest grade separator at Katni.

2 August 2026 : The ISSE Baramati Local Centre (ISSE BLC), jointly with Scon Infra Prestress LLP, organized a technical programme on 2 August 2026, receiving an enthusiastic response from the engineering fraternity. The programme commenced with the traditional lighting of the ceremonial lamp, followed by a technical session by Er. Jayant Inamdar, who shared his knowledge and experience with the participants.

The programme also featured a product presentation and technical information session by Er. Niranjan Kane, who explained the concepts and practical applications of prestressing technology. More than 80 structural engineers, builders, architects, academicians, students and industry professionals participated. Chairman Er. Ganesh Narute welcomed the participants, Dr. Snehal Walke compered the programme and Secretary Er. Mayur K. Tade delivered the Vote of Thanks. The programme concluded with dinner and professional interaction.



22 August 2026 : ISSE organized the Late Er. R. L. Nene Memorial Webinar, titled "Adventures of a Globe-Trotting Civil Engineer", on 22 August 2026 through the MS Teams platform. The session was delivered by Er. Jagdish Rele, Founder & CEO, Chaiam Consultants, and commenced at 11.00 am.

4 September 2026 : Seminar and Panel Discussion

"IS 875 (Part 3): Rethinking Wind Loads for Tall Buildings"

The Council on Vertical Urbanism (CVU) – India Chapter, Indian Society of Structural Engineers (ISSE) and Institute of Chemical Technology (ICT), Mumbai, jointly organized a seminar and panel discussion on "IS 875 (Part 3): Rethinking Wind Loads for Tall Buildings" on 4 September 2026. The programme brought together professionals from wind engineering, structural engineering, high-rise design and the wider built environment. The event was emceed by Mr. Gautam Bhasin, while Mr. Anil Hira delivered the welcome address and moderated the panel. Er. Hemant Vadalkar shared insights into ISSE's mission and initiatives, Prof. Aniruddha Pandit highlighted academia–industry collaboration, and Mr. Aun Abdullah shared an industry perspective. The technical presentation was delivered by Dr. Suresh Kumar K. of RWDI, followed by a panel comprising Dr. Suresh Kumar K. (RWDI), Mr. Misam Imam (Thornton Tomasetti), Dr. Prasad Marepalli (Lodha), Mr. Nikhil Joshi (JW Consultants), Er. Vatsal Gokani (Gokani Consultants) and Mr. Ashish Bhangle (Dr. Kelkar Designs Pvt. Ltd.). Discussions focused on wind loading for tall buildings, structural strength and stability, drift, occupant comfort and serviceability in increasingly complex building forms. The programme was supported by Subodh Arora, Dilip Sarode, Nikhil Shanghvi, Umesh Patil, Fayazuddin Shaik, Christina Fernandes, Nirupama Thomas, Krishna Kumar D.P., Sameer J S., Deepshikha Goel Surendran and Prerna M.



10 September 2026 : ISSE Student Chapter Inauguration at DMCE, Airoli

The Department of Civil Engineering, Datta Meghe College of Engineering (DMCE), Airoli, in association with ACES and in collaboration with the ISSE Kalyan - Dombivali Local Centre, inaugurated the ISSE Student Chapter on 10 September 2026. The programme brought together structural engineering professionals, faculty members and students, marking an important step towards technical learning, professional networking and industry interaction.

ISSE was represented by Er. Hemant Vadalkar – President, ISSE; Er. Madhav Chikodi – Member, ISSE; Er. Srinivasan Mudaliar – Chairman, ISSE Kalyan - Dombivali Local Centre; Er. Aditya Deshmukh – Secretary, ISSE KDLC; Er. Manohar Patil – Treasurer, ISSE KDLC; and Er. Girish Marathe – Managing Committee Member, ISSE KDLC. DMCE dignitaries included Dr. Sudhir Sawarkar – Principal; Dr. Smita Patil – HOD, Civil Engineering; Dr. Atulya Patil – HOD, Civil & Infrastructure Engineering; Dr. Prasad Dode – Professor; and Mr. Prashant Barbude – Assistant Professor.

The inauguration included unveiling of the ISSE Student Chapter plaque and distribution of certificates to student members. This was followed by a technical session on “High-Rise Building Planning” by Er. Ashish Bhangle, Director, Dr. Kelkar Designs Pvt. Ltd., Mumbai, covering IS 16700, wind and seismic loads and practical high-rise projects. Ms. Jessly Rajan and Dr. Nilesh Lende served as ISSE Faculty Coordinators, along with the ACES team and student coordinators.



11September 2026 : The Department of Civil Engineering, VCET, under its ISSE Student Chapter, organized NIRMITI 2026 – Product Showcase: “Beyond the Blueprint” on 11 September 2026. The event provided students with a platform to showcase innovative products, models, ideas and practical engineering solutions, encouraging them to transform classroom learning into real-world applications.

Mr. Paresh Unnarkar, Treasurer, ISSE, was the Chief Guest, accompanied by Mr. Jitendra Hatkar, Secretary, ISSE Palghar Centre. Their interaction with the students provided an industry perspective and encouraged the young engineers to pursue creativity, innovation, teamwork and engineering excellence.



11 September 2026 : Er. D. S. Parihar, Str consultant delivered lecture on RCC, PT & PEB construction’s challenges and Solutions.

12 September 2026 : Conference on Liveable cities at Nehru Centre by Architectural division of The Institution of Engineers

15 September 2026 : Engineers’ Day Celebration and Technical Session

The ISSE Baramati Local Centre (BLC), in association with Dalmia Cement Group, organized an Engineers’ Day Celebration and Technical Session on 15 September 2026 at Hotel City Inn, Baramati. Engineers from Pune, Phaltan, Indapur, Lonand, Purandar, Daund, Shrigonda and surrounding regions participated in the programme. The celebration included a floral tribute to Bharat Ratna Sir Mokshagundam Visvesvaraya in recognition of his contribution to engineering and nation-building.

The technical session was delivered by renowned scientist and civil engineering expert Dr. Hemant B. Dhonde on “Failure Case Studies in Construction with Innovative Solutions.” He discussed construction failures, their causes and consequences, and practical engineering solutions for preventing such failures. The programme also featured the launch of ISSE BLC T-shirts, followed by a cake-cutting ceremony to mark Engineers’ Day.

19 September 2026 : Congratulations to team EPICONS on receiving Industry Excellence Award- Platinum category from IEI (I) at a Grand function at Delhi



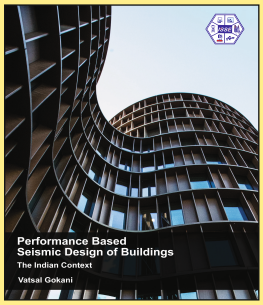
22 September 2026 : Engineers day celebration at IEI Mahalaxmi – Felicitation of Dr. V. N. Gupchup and N. N. Shrikhande.

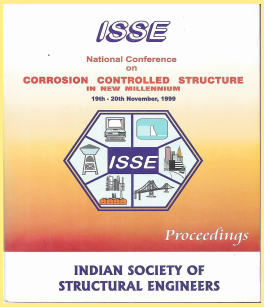


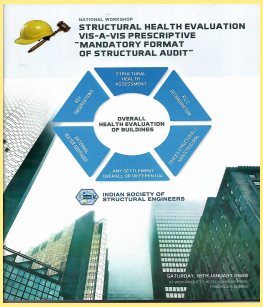
26 September 2026 : During Annual Concrete day celebration with outstanding structure’s award function of ICI and Ultra Tech Cement, the chairman & Secretary of ISSE Indore chapter were elicitated being Jury member.

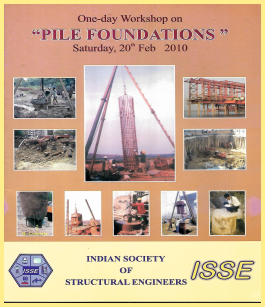
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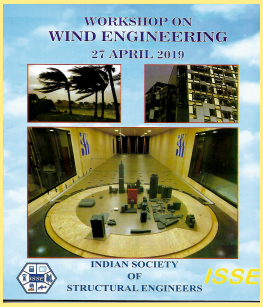
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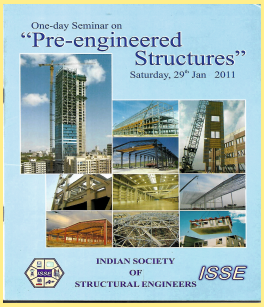


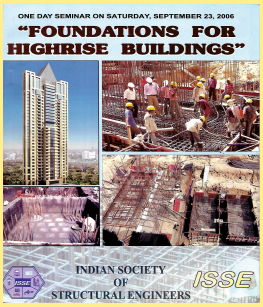


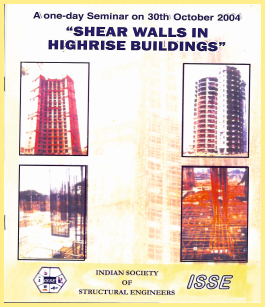


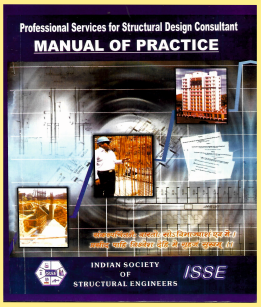




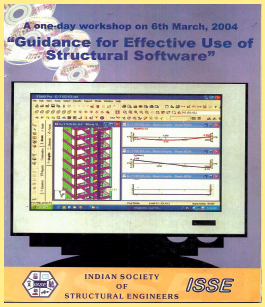








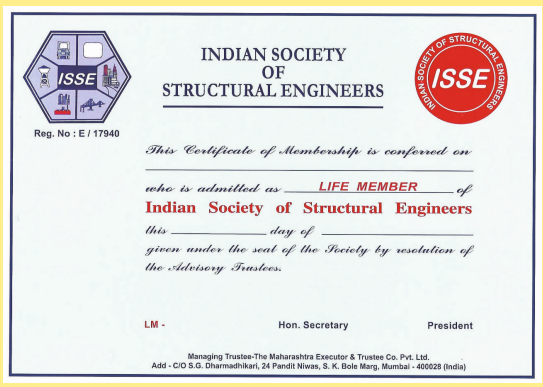




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