SRI JAYACHAMARAJENDRA COLLEGE OF ENGINEERING, MYSURU – 570006
DEPARTMENT OF CIVIL ENGINEERING

2016

VINYASA

Volume - 2

CONTENTS

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Editorial

Dr. K. Prakash
Professor & Head
Department of Civil Engineering
S.J. College of Engineering, Mysuru-06
Staff Advisor

The 2nd volume of **'VINYASA',** the magazine of the Department of Civil Engineering, SJCE, Mysuru is in your hands. I congratulate the student editors Ms. Vinyasa G.C. and Mr. Raghunandan S. for making this volume more colourful by the including the art work contributed by the students of the department.

Changes have been made in Programme Outcomes (POs) of the department, and Programme Specific Outcomes (PSOs) are also included as a part of OBE system being practiced at SJCE, Mysuru as per Dec., 2015 version of NBA guidelines. This information have also been included in this issue of the magazine for the benefit of the stake holders.

Vinyasa G.C.
III Year B.E. (Civil)
Student Editor

It's that time of the year where you put all your technical stuff not just in your internals and exams alone, but at a place which gives recognition beyond just marks. Yes! you got it right!! Here comes the NEWS LETTER FOR THE YEAR 2016 FROM THE DEPARTMENT OF CIVIL ENGINEERING –"VINYASA"

Raghunandan S
III Year B.E. (Civil)
Student Editor

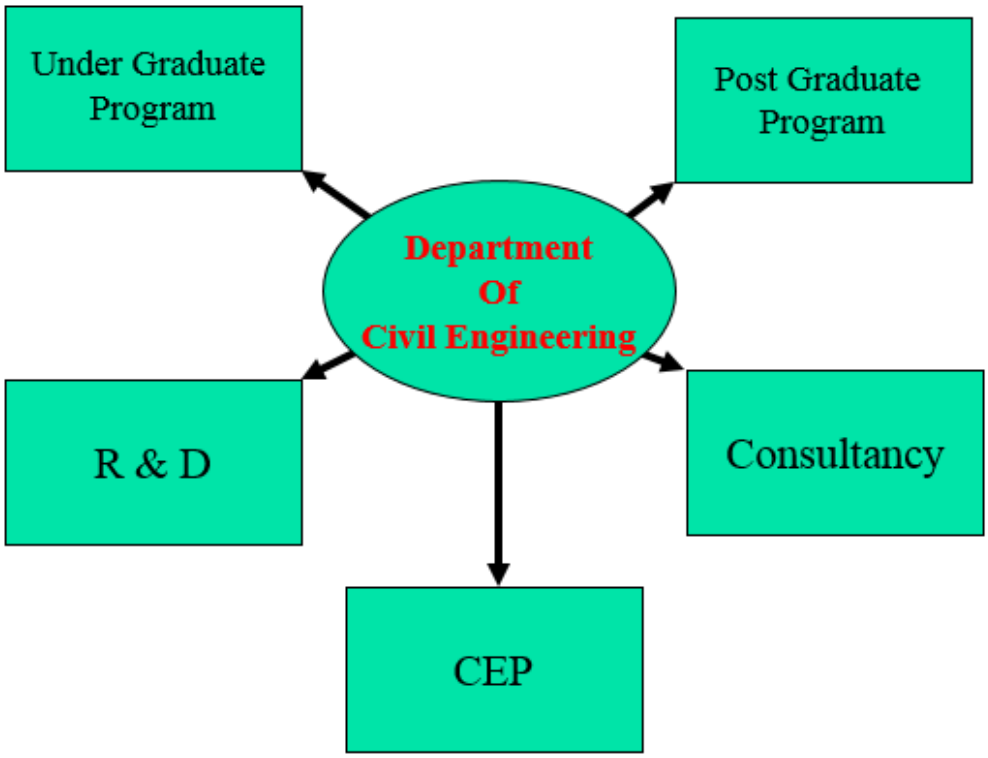
DEPARTMENT OF CIVIL ENGINEERING

SRI JAYACHAMARAJENDRA COLLEGE OF ENGINEERING, MYSURU – 570 006

Department of Civil Engineering e-mail ID: sjcecivil14@gmail.com

List of Faculty

Sl. No.	Name	Designation	Specialization	Residence / Mobile No.	e-mail ID
1.	Dr. K. Prakash	Professor & Head	Geotechnical Engineering	2487132 / 9483341204	kprakash60@yahoo.com
2.	Dr. C. Nataraju	Professor	Water Resource Engineering	9448208799/ 9481830999	cnataraju68@yahoo.co.in
3.	Dr. M.C. Nataraja	Professor	Structural Engineering	2343521 / 9880447742	nataraja96@yahoo.com
4.	Dr. S.K. Prasad	Professor	Earthquake Geotechnical Engineering	2514159 / 9449621994	prasad_s_k@hotmail.com
5.	Sri. Satish R.	Associate Professor	Structural Engineering	9448639448	satishrsjce@rediffmail.com
6.	Dr. S. Raviraj	Professor	Structural Engineering	2542179 / 9449018180	rasho@rocketmail.com
7.	Dr. G.P. Chandradhara	Professor	Structural Engineering	2341789 / 9448246425	chandu_gpc@yahoo.com
8.	Sri. V. Madhava Rao	Associate Professor	Remote Sensing & Photogrammetry	2364552 / 9448366552	madhavraov@rediffmail.com
9.	Sri. H.L. Girish Raje Urs	Associate Professor	Materials Technology	9481821966	gurs_60@yahoo.com
10.	Dr. K.S. Manjunath	Professor	Building Science & Technology	2515391 / 98801 03291	ksm3363@rediffmail.com
11.	Dr. P. Nanjunda Swamy	Professor	Highway Engineering	2544040 / 9449264365	pnswamy@yahoo.com
12.	Dr. Pradeep M.P.	Assistant Professor	Hydraulics / Water Resources Engineering	8951736528	pradeep_nitk2004@yahoo.co.in
13.	Smt. Roopanjali R.	Assistant Professor	Environmental Engineering	9945210009	roopanjalis@gmail.com
14.	Sri.Sharath H.P.	Asst. Professor	CAD Structures	9886542614	sharathhp.pes@gmail.com
15.	Sri. Rahul	Asst. Professor	Construction Technology & Management	0-7509121970	rahuluvce2007@yahoo.co.in
16.	Sri. Mahendara Kumar H.M.	Asst. Professor	CAD Structures	9964820868	manuhm33@gmail.com
17.	Dr. Syed Shakeeb Ur Rahman	Honorary Professor	Structural Engineering	9448071986	ssr_sjce@yahoo.co.in
18.	Sri. N.M. Jagadeesh	Assistant Professor (Retd.)	Geotechnical Engineering	9448128284	-



Vision and Mission of the Department of Civil Engineering	
VISION	
	To produce engineers having professional and leadership qualities with capacity to take up professional and research assignments in Civil Engineering and allied fields with focus on inter-disciplinary and innovative approach and to compete in Civil Engineering profession at the global level.
MISSION	
	• To impart quality and real time education to contribute to the field of Civil Engineering. • To impart soft skills, leadership qualities and professional ethics among the graduates to handle projects independently. • To develop graduates to compete at the global level. • To deal with the contemporary issues and to cater to the societal needs.

Programme Educational Objectives (PEOs)	
PEO1	To impart quality education and knowledge in contemporary science and technology to meet the challenges in the field of Civil Engineering and to serve the society.
PEO2	To impart the knowledge of analysis and design using the codes of practice and software packages.
PEO3	To inculcate the sense of ethics, morality, creativity, leadership, professionalism, self confidence and independent thinking.
PEO4	To motivate the students to take up higher studies and innovative research projects.

Programme Specific Outcome(PSOs)	
PSO1	The student has the ability to apply the knowledge of Physics, Chemistry, Mathematics, Programming Skills and Soft Skills to solve Civil Engineering problems.
PSO2	The student has the proficiency in streams of Civil Engineering to visualise and execute the systems for sustainable living.
PSO3	The student has the practical knowledge and experimental skills to tackle Civil Engineering problems using technical and management skills, exhibiting professional ethics to meet the societal needs.
PSO4	The programme enables the faculty to develop academic proficiency by involving in research & innovation, interaction with industry and professional bodies through technical advice and Continuing Education Programs (CEP) to meet the needs of the user system.

Programme Outcomes (POs)	
Engineering Graduates will be able to:	
P01	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems – (**Engineering knowledge)**
P02	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences – **(Problem analysis)**
P03	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations – (**Design/development of solutions**)
P04	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions – (**Conduct investigations of complex problems**)
P05	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations – (**Modern tool usage**)
P06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice – (**The engineer and society**)
P07	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development – (**Environment and sustainability**)
P08	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice – (**Ethics**)
P09	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings – (**Individual and team work**)
P10	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give

	and receive clear instructions – (**Communication**)
P11	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments – (**Project management and finance**)
P12	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change – (**Life-long learning**)

- **Awards / Recognition**

Faculty

- Dr. K. Prakash, was honoured with **INSA Teachers Award 2015** by Indian National Science Academy, New Delhi.
- Dr. M.C. Nataraja, was honoured with **Best Technical** paper award by ICI, India.
- Dr. S.K. Prasad was honoured with Best paper award at International Conference in Advances in Materials and Technology ICMAT 2016, 26 – 28 May 2016, SJCE, Mysuru.

Students

- Ms. S. Bindushress was honoured with the "Best Student Award" by M/s Tata Consultancy Services Ltd. for the year 2015-16.
- Mr. Shariq Khan was felicitated by Civil 83 Team for being the topper in B.E. (Civil Engineering), 2014-15 on 17th October, 2015 in a function organised at SJCE, Mysuru.
- The following VI Semester B.E. students of the department have been selected for the prestigious Indian Academy of Science Summer Research Fellowship Programme of the three science academies of India for the year 2016 at the premier institutes indicated against their names.
    - Mr. Adithya G.P. - Indian Institute of Technology Kharagpur, West Bengal.
    - Mr. Siddharth Prabhu N. - Indian Institute of Technology Bombay, Mumbai.
    - Mr. Raghunandan A.S. - Indian Institute of Technology Bombay, Mumbai.

Dr. K. Prakash receiving INSA Teachers Award 2015

Felicitation to Mr. Shariq Khan by Civil-83 team

List of Faculty Research Publications

a) National / International - Journals

- Sridharan, A. and Prakash, K. (2016), "Expansive Soil Characterisation: An Appraisal", INAE Letters, Vol. 1, No. 1, pp. 29-33, DOI. 10.1007/s41403-016-0001-9.
- Rajamane N. P., M C Nataraja, R. Jeyalakshmi and S Nithiyanantham, "Greener durable concretes through geopolymerisation of blast furnace slag", Materials Research Express, Vol 2, No 5, 2015, http://iopscience.iop.org/2053-1591/2/5/055502/, p8.
- Pushpa, K., Prasad S.K. and Nanjundaswamy P. (2016) "Critical analysis of Slope Stability analysis methods", International Journal of Engineering Research & Technology, https://www.ijert.org/, *ESRSA Publication, ISSN; 2278-0181,* Volume. 5, Issue. 07, July – 2016, http://dx.doi.org/10.17577/IJERTV5IS070148.

b) National / International – Conference

- Prakash, K., Prasanna, H.S. and Sridharan, A., "Variation of Degree of Saturation along the Compaction Curve", Proceedings of Indian Geotechnical Conference IGC-2015, Pune, India, 17th - 19th Dec., 2015.
- Prasad, S.K., (2016) "Performance Based design in Earthquake Engineering", Keynote Lecture, National Conference on Latest trends in Civil Engineering and sustainable development from 26th to 27th February 2016, Mangalore Institute of Technology & Engineering, Moodabidri
- Sunil Nataraj, Prasad S.K. and Shivakumara Swamy B., "Study on Influence of Stiffness Variation on the Seismic Performance of Strong Column-Weak Beam RC Frames from Pushover Analysis", International Conference on Earthquake Engineering and Post Disaster Reconstruction Planning (ICEE-PDRP 2016)" on 24-26 April, 2016 at Bhaktapur, Nepal.

➢ **Workshops / Conferences organized**

Date	Title	Organized in collaboration with	Duration
07.05.2016	One Day National Workshop 'Recent Advances in Geotechnics for Infrastructure – RAGI 2016'	– NIE, ACCE(I), Mysore Chapter and TEQIP-II	1 Day
17.03.2016	One day workshop on 'Ready Mix Concrete'	M/s Ready Mix Concrete, Mysuru	01 Day
27.11.2015	DESIGN SAFE - 2015, one day Colloquium on 'Precast & Prestress technology for Sustainable Construction'	Association of Consulting Civil Engineers (India), Mysuru	01 Day

➢ **Expert Lectures organized**

Sl. No.	Name of the Invited Speaker	Title of the Lecture delivered	Address of the Speaker	Date of the Lecture
1.	Sri. R. Vedhachalam	Financial & Contractual, Tender & QA – QC	Technical Advisor, Ex Officio, HBK Holding – State of Qatar	24.03.2016
2.	Sri. R. Vedhachalam	Construction Functions & Specialty Construction	Technical Advisor, Ex Officio, HBK Holding – State of Qatar	23.03.2016

Sl. No.	Name of the Invited Speaker	Title of the Lecture delivered	Address of the Speaker	Date of the Lecture
3.	Sri. Shelly S. Fernandez	"Why Concrete is so Humane?" during one Day Workshop on "Ready Mix Concrete"	General Manager and Cluster Head M/s RMC Ready Mix (India)	17.03.2016
4.	Sri. Subash	"Special Products" during one Day Workshop on "Ready Mix Concrete"	Deputy Manager (Special Products) M/s RMC Ready Mix (India)	17.03.2016
5.	Sri. R. Vedhachalam	Principles of Contracts, Construction procedure &Site Works management	Technical Advisor, Ex Officio, HBK Holding – State of Qatar	16.03.2016
6.	Mrs. Geetha R. Shah	"Various Competitive Exams for Professional Courses and Campus Recruitment"	Manager Vista Mind Education Pvt. Ltd., Mysuru	11.02.2016
7.	Dr. Shuichi Torii	"Renewable Energy" International Workshop on "Advances in Engineering"	Dr. Shuichi Torii Professor of Mechanical Engineering, Kumamoto University, Japan.	16.12.2015
8.	Dr. Babu Narayan	"Analizing the Analysis" International Workshop on "Advances in Engineering"	Dr. Babu Narayan Professor of Civil Engineering NITK, Surathkal.	16.12.2015
9.	Dr. B.M. Sunil	"Landslide Engineering and Disaster Management" International Workshop on "Advances in Engineering"	Professor of Civil Engineering NITK, Surathkal	16.12.2015
10.	Dr. Rajagopal	"Finite element formulation of a thermodynamically consistent nonlocal damage model for concrete".	Professor, Department of Civil Engg. IIT Hyderabad, Hyderabad	05.12.2015
11.	Dr. Rajagopal	"Recent advances in nonlocal approaches for modelling damage/ fracture in concrete".	Professor, Department of Civil Engg. IIT Hyderabad, Hyderabad	04.12.2015
12.	Sri. N.R. Ashok	"New Technologies in Civil Engineering"" (Prof. Srichand Endowment Lecture)	Managing Director, ACE Technologies Ltd., Bengaluru	17.10.2015
13.	Prof. S. Narasimha Rao	"Importance of Soil Investigation" (Second K.N Subramaniah Memorial Endowment Lecture)	Professor (Retd.) IIT – Madras, Director-Tamilnadu Road Development Corporation	22.08.2015

Achievements of the students

- The students of Civil Engineering department have participated in CONCRETE FAIR '15, a National Level Technical Symposium, organized by the R.V. College of Engineering, Bangalore, in collaboration with Indian Concrete Institute, on 15th and 16th October, 2015 and have won the Champions Trophy.
- The students from the department of Civil engineering, SJCE, Mysuru regularly participate in various inter-institute events conducted by many educational institutions and receive prizes / awards / recognition.

Sl. No.	Details of the Tech. Fest	Name of the student(s)	Class	Event	Prize won
1.	YUKTI-2016, an inter-college quiz competition, organized by 'Shilpi' - student wing of Builders Association of India, Mysuru Center, on 06th March, 2016.	Mr. Mohamed Zaidur Rahaman and Ms. Bindusree S.	VIII Sem. B.E. (Civil Engg.)	Technical Quiz	First Prize
2.	DESIGN SAFE - 2015, one day Colloquium on "Precast & Prestress technology for Sustainable Construction" organized in Association with ACCE (I), Mysuru on 27th November, 2015	Ms. Anusha A Tippannawar and Mr. Sandeep Mahaveer Mekkalike	III Sem. M.Tech. (IS)	Technical Quiz	First Prize
		Mr. Prakasha G and Mr. Siddanagouda Y Balaganur	III Sem. M.Tech. (IS)	Technical Quiz	Second Prize
		Mr. Puneet Pasodi and Mr. Tipparay Kareppa Toravi	I Sem. M.Tech. (IS)	Technical Quiz	Third Prize

- **Foreign Visit**

  Dr. S.K. Prasad Participated in Tamasek – NUS Foundation initiative as fellow in 'University Management' at National University of Singapore representing Government of India from MHRD from 28/9/2015 to 2/10/2015.

- **Societal Outreach Activity**
  - Dr. C. Nataraju – Member, District Coordination and Executive Committee of Rajeev Avas Yojane, MCC, Mysuru.
  - Dr. G.P. Chandradhara
    - Corporation Technical adviser-Public Bicycle Sharing System
    - Technical Committee member- STPI
    - Coordinator - activities of the JSS Museum.

Technical

Importance of Performance Enhancers Recommended in new BIS Cement Codes

Dr. M.C. Nataraja, Professor, Department of Civil Engineering

Abstract: One of the major functions of the Bureau of Indian Standards is the formulation, recognition and promotion of the Indian Standards. As on 31 August 2016, 26552 Standards formulated by BIS, are in force. These cover important segments of economy, which help the industry in upgrading the quality of their products and services. BIS has revised the codes on ordinary Portland cement covering 33, 43 and 53 grades in 2013, just three years ago. This revision is still not noticed by most students and professionals. From these codes it is observed that the specifications of these three grades of cements are more or less similar and comparable. Keeping this in mind, the BIS has now come out with a single code covering the different grades of OPC and the same is released in December 2015. In addition BIS has recommended the use of performance enhancers in the production of cement. This paper discusses some of the salient points of this code for the benefit of the readers.

1. Introduction

BIS has released IS: 269 code in December 2015 on specification of Ordinary Portland Cement [1]. This standard pertains to OPC and covers the requirements such as manufacturing, physical and chemical requirements, packing and making. In this revision the specifications pertaining to 33, 43 and 53 grade cements have been included which were previously covered in separately codes published in 2013[2-4]. These three codes on 33, 43 and 53 grades will be withdrawn subsequently. As per Indian Gazette the codes on 33, 43 and 53 grade cements published in 2013 [2-4] are invalid after 27th July 2016 [5]. In the new code chemical and physical requirements of OPC for all grades are provided separately in two tables.

2. Industrial by products

Use of industrial by products from copper, steel and zinc industries and from oil refinery, manufacture of cement by interblending process, uniform value of insoluble residue to 5% irrespective of grades of cement, modifications to provisions for railways sleeper cements (43S and 53S), requirement of making the ‘best before date’ of cement are some of the significant modifications introduced in this code [1].

One of the most interesting things incorporated in the earlier revision of 33, 43 and 53 grades cement [2-4] and in the present IS:269-2015[1] is the use of performance improvers. In this paper importance of performance improvers based on literature is discussed in brief.

3. **Performance improvers**

Many organic compounds are added to the clinker in the cement mill as grinding aids. The main purposes of using these aids are to reduce the energy required to grind the clinker into a given fineness and thereby increasing the efficiency of the cement mill. In addition, some grinding aids also provide important positive effects on the final cement such as, rheology of the fresh cement paste or concrete and improved strength development. Grinding aids that provides these additional properties are called quality improvers or the performance enhancer. Conventional grinding aids are used to increase the production rate in the cement mill. If such additions give beneficial chemical effects during hydration of the final cement (e.g. increased strength, improved workability etc.) the grinding aid is regarded as quality improver or performance enhancer. It is emphasized that several conventional grinding aids today are also claimed to give beneficial chemical effects to a certain extent. Performance enhancers (quality improvers) are supposed to increase the efficiency of the cement mill and at the same time preserve sufficient 'workability' of the dry cement i.e. not giving rise to problems like clogging during storage, packing or offloading from bulk transportation. In addition, the additives shall enhance the rheological and strength properties for fresh and hardened concrete respectively. In regard to the latter, a true quality improver must increase the early strength due to a chemical effect and not only due to increased fineness of the cement. There are few studies where both the cement powder and concrete properties are studied, in particular where the additive is added in the grinding process [6-9].

Desirable effects of using performance improvers in cement making are; increased grindability, increased or maintaining sufficient powder fluidity, workability or rheological effects, hydration effects: retarding/accelerating effects, and increased strength. The revised IS:269-2015 recommends many such performance improvers which are industrial by products from copper, steel and zinc industries and from oil refinery. In addition the manufacture of cement by interblending process by intimately and uniformly blending the individual ground materials has been permitted. The various performance improvers suggested in the code are; fly ash, ground granulated blast furnace slag, silica fume, metakaoline, rice husk ash, lime stone, copper slag, lead slag, lead-zinc slag and spent fluidized catalytic cracking equilibrium catalyst. Individually or in combination these materials can be used to an extent of 5% by mass. The requirements of these materials as per IS: 269 should be checked before use [1]. Some of these performance improvers are recommended in the earlier IS codes as well [2-4].

4. Conclusions

- The revised code is drafted taking in to consideration the performance enhancer and hence the present day OPC are better compared to the earlier codes.
- Uses of latest codes are mandatory for consultancy and research purpose point of views.
- Use of Industrial by products enhances the various mechanical and durability related properties of mortar and concrete

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3. IS:8112-2013, Ordinary Portland Cement, 43 Grade- Specification, Bureau of Indian standard, New Delhi, 2013
4. IS:12269-2013, Ordinary Portland Cement, 53 Grade- Specification, Bureau of Indian standard, New Delhi, 2013
5. Indian Gazette No. 311, New Delhi, Thursday, February 4, 2016
6. S. Sohoni, R. Sridhar, G. Mandal, 'The Effect of Grinding Aids on the Fine Grinding of Limestone, Quartz and Portland-Cement Clinker', Powder Technology, Vol. 67 (3), 1991, pp. 277- 286.
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Study and Importance of Resonance in Structural Engineering

Dr. G. P. Chandradhara, Professor, Dept. of Civil Engineering

INTRODUCTION

The mathematical model plays an important role in structural dynamics. The number of degrees of freedom (DOFs) of a structural system is the number of independent displacement coordinates that are necessary to completely describe the displacement or deformed shape of the structure. In general, a continuous system has an infinite number of degrees of freedom. Nevertheless, the process of idealization permits the reduction in the number of degrees of freedom to a discrete number and in some cases to just a single degree of freedom (SDOF). However, behaviour of SDOF systems is probably the most important topic in structural dynamics.

The natural frequency of vibration of any dynamic system isa fundamental indicator of the dynamic response characteristics of the system. The natural frequency of the structure is a function of mass (m) of the structure, material damping properties and stiffness of the structure (k). For an undampedSDOF system, the natural frequency ω in rad/sec is given by

$$\omega = \sqrt{\frac{k}{m}} \qquad \text{(eq.1)}$$

Natural frequencyis an inherent property of a building.The natural period is the reciprocal of natural frequency and is the time taken for one complete cycle of oscillation. Some examples of natural periods of different structures are shown in Fig. 1. Both natural period and natural frequency are widely used in dynamic analysis. Whenever a system is acted by a periodic series of impulses having a frequency equal to or nearly equal to natural frequency of the system, the system will be under resonance and set into oscillation with a relatively large amplitude. In structural dynamics, determination of natural frequency and resonance effects play an important role.In order to understand the effect of resonance, an experimental study has been carried out by the undergraduate students using the available shaking table setup.

DETAILS OF EXPERIMENTAL MODEL

In structural dynamics, buildings can be idealised and modeled as SDOF system as the mass of building is assumed to be concentrated at the floor level and the entire stiffness is modeled by an equivalent stiffness. The models consist of aluminum flats which represents the columns and wooden mass at top which represents the floor mass of building.Four models with same mass are considered and the column length of each model is varied so as to vary the stiffness and natural frequency. As the height of models decreases, stiffness of columns increases and there by natural frequency increases. All the models are placed in a staggered manner over a single steel base plate of 10 mm thick in order to facilitate vibrations without any collision with each other. The base plate is rigidly fixed to the shaking table. Acceleration sensors are mounted on these models to capture the response acceleration of the models. The specifications of the models and the corresponding natural frequency are listed in Table 1. The four models will represent the buildings with different natural frequency or natural period. The complete setup is shown in Fig.2.

Table 1: Analytical results of natural frequency

Title	Mass (kg)	Effective length (m)	Stiffness k (N/m)	Natural Frequency (Hz.)
Model 1	0.188	0.525	80.466	3.292
Model 2	0.190	0.425	151.679	4.496
Model 3	0.180	0.325	339.189	6.908
Model 4	0.180	0.225	1022.222	11.993

DYNAMIC RESPONSE OF MODELS

The experimental study was carried out on the models by applying sinusoidal base motion of known amplitude using horizontal shaking table. The acceleration data both at base and at top of the models are recorded with the help of acceleration sensors. The data is collected and stored using DEWE-Soft data acquisition software. The raw data obtained from the sensors are filtered to remove some unwanted noise. The frequency of base motion is varied gradually from 1 Hz to 12 Hz and acceleration response was captured. Displacement is obtained by integrating the acceleration and dynamic magnification factor (DMF) is obtained by dividing the peak response displacement by the base motion displacement. Fig. 3 shows the variation of DMF with the external base motion frequency. It is observed that all the

models show the peak DMF when the natural frequency of each model is nearly equal to external base motionfrequency. Thus at resonance, each model displacement at top is about 100 to 200 times the base displacement. It is interested to visually observe that as the external base motion frequency is nearly equal to the natural frequency of the first model i.e. around 3 Hz, only the first model stars vibrating rapidly indicating that the model 1 is at resonance. Similarly, as the input base motion frequency is increased, successively second, third and fourth model stats vibrating rapidly as and when the natural frequency of each model coincides with the base motion frequency.

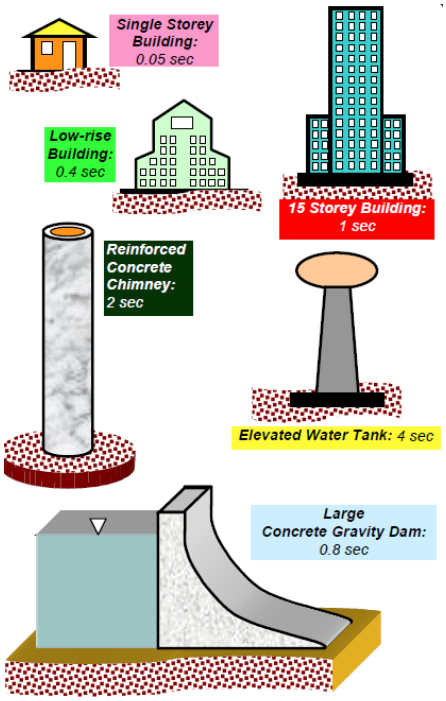

Fig. 1: Fundamental natural periods of structures

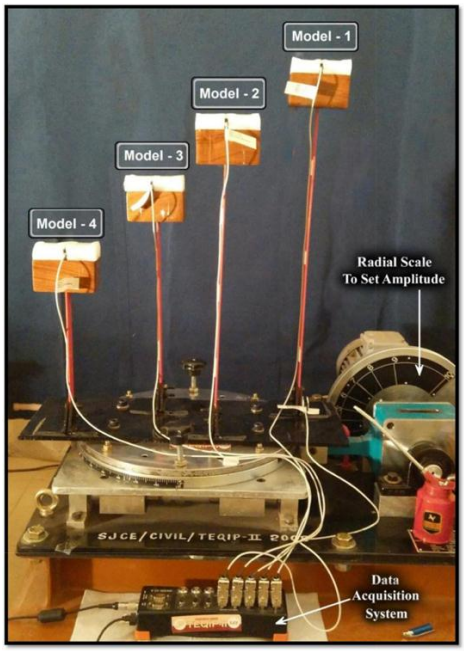

Fig. 2: Experimental setup showing SDOF models

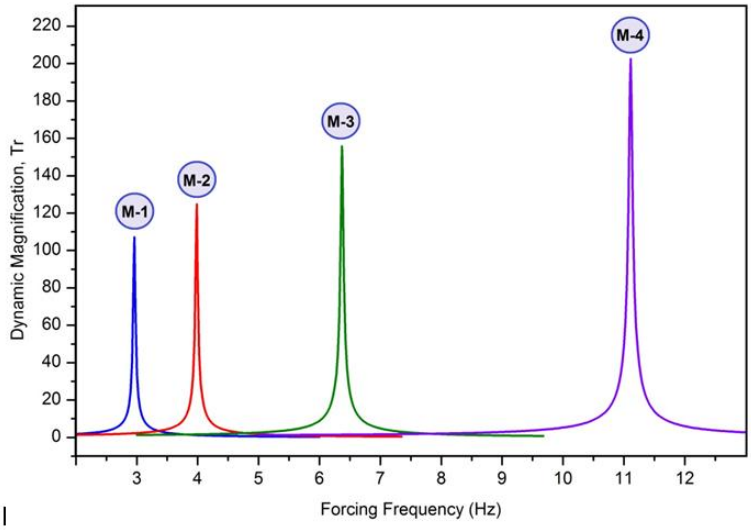

Fig. 3: Variation of DMF with forcing frequency in all the models

REMARKS

The idealisation of models as SDOF is acceptable as the results of analytical equation matches well with the experimental results. It is observed that at resonance, theresponse is maximum and the system experience huge displacement. It is generally not possible to design the system for resonance as it becomes very expensive. However, it is recommended to avoid the resonance while designing the structure by suitably modifying the stiffness of the system. There are a number ways of modifying the stiffness of structural system.

CIVIL ENGINEERS

-the builders of tomorrow !!

Vinyasa G.C., III year B.E. (Civil)

Civil engineering is about community services, development and improvement of the society which deals with the planning, design, construction and operation of facilities essential for the modern life, ranging from transit systems to offshore structures to space satellites. Civil engineers are problem solvers, meeting the challenges of pollution, traffic congestion, drinking water, energy needs, urban development, and community planning and so on.

"***CIVIL ENGINEERS ARE THE DOCTORS OF THE COMMUNITY WORKING FOR BETTERMENT OF THE SOCIETY"***

Civil engineering is the most diversified discipline that includes structural engineering, environmental engineering, transportation engineering, water resources engineering, foundation engineering, earthquake engineering etc.

HISTORY

- Oldest branch of engineering, next to military engineering,
- Application of physics, mathematics and scientific principles
- A professional engineering discipline that deals with the analysis, design, construction and maintenance of infrastructural facilities such as buildings, bridges, dams, roads, railways, airports, harbors, tunnels etc.
- The earliest practices of civil engineering might have commenced between 4000 and 2000BC in ancient Egypt and Mesopotamia when humans started to abandon a nomadic existence, thus causing a need for the construction of shelter. During this time, transportation became most important leading to the development of the wheel and sailing.

From the pyramids of Egypt to international space station, civil engineers have always been faced multi challenges and built quality of life. Each creature is unique challenge for civil engineers. Civil Engineers are in the fore front of technology. They are the leaders in the usage of sophisticated high-tech products- applying the very latest concepts like computer aided design (CAD), project scheduling and cost estimation.

Civil Engineers are adopting the concept of sustainable development in the present context. The concept of sustainable development was first proposed by the Brundtland Commission in 1972 as "meeting the needs of the present without compromising the ability of the future generation to meet their own needs"

"ENGINEERS ARE THE CREATORS OF CIVILZATION"

Throughout the ages, Civil engineering has provided creative and feasible solutions to many of the basic human needs and problems, and it still continues to take pride in being a fundamental building block of civilization. Civil engineers work to solve a wide variety of problems associated with the infrastructure and daily service needs of society. It's a diversified field that opens the door for careers in a wide variety of areas.

Construction industry is one of the largest industries next to agriculture, employing a large number of people. Construction industry contributes significantly in terms of scale and share in the development process for both developed and developing countries. Civil engineers are playing a vital role in improving quality of life by adopting modern construction techniques.

The hands behind the 7 wonders of the world are Civil Engineers.

Civil Engineers not only connect the roads, build the bridges….between nations to nations but also connect the relationship between people.

Each day millions of people utilize these marvels of modern civilization, speeding through intricate transportation system, residing behind the safety of dams, and streaming in and out of the buildings. Few, however give much thought to mechanics that make the modern world possible. But credit first goes to the builders of these marvels!!

As the technology revolution expands, as the world's population increases and as environmental concerns mount, Civil Engineers are helping to make our world as better place to live.

Budding Artists

KEERTHANA R
III Year B.E. (Civil)

BINDHUSHREE J
III Year B.E. (Civil)

Photography is also an Art !

CHANDRAKIRAN B S
III Year B.E. (Civil)

AKSHAY S J
III Year B.E. (Civil)