

Academic Staff: 21, Students admitted: PG: 45 ; PhD: 7;

Publications in Journals: 38 , Conferences: 27 , Book/ Books Chapters

Projects: Research (Rs. In Lacs): 1622.20 , Consultancy (Rs. In Lacs): 980.10

1. SALIENT FEATURES

Department of Earthquake Engineering at the Indian Institute of Technology Roorkee (erstwhile University of Roorkee) was established in 1960 as School of Research and Training in Earthquake Engineering. Four major areas of earthquake engineering viz., Structural Dynamics, Soil Dynamics, Engineering Seismology and Seismotectonics, and Instrumentation have been nurtured for the last fifty years. The department provides Master's degree in three specializations namely, Structural Dynamics, Soil Dynamics, and Seismic Vulnerability and Risk Assessment. The major functions of the Department include teaching and research, and rendering expert advice to various organizations in the area of earthquake resistant design of structures and systems, such as dams, bridges, power plants, etc. The Department has played a key role at the national level in the formulation of Indian Standard Codes of Practice for earthquake resistant design of Structures.

Several major facilities have been developed in the Department to conduct experiments related to earthquake engineering. Some of the major facilities include: a low cost railway wagon shock table for dynamic testing of structural models, a computer controlled shake table to stimulate strong ground motion, a quasi static testing laboratory having servo-controlled dynamic actuator systems and servo-controlled compression testing machine, a soil dynamics laboratory equipped with liquefaction table, cyclic triaxial testing system, and resonant column apparatus, a seismological observatory having state of the art broadband seismograph to record earthquake ground motion, a strong motion network of 300 digital accelerographs deployed in the Himalayan region to measure strong ground motion due to moderate and major earthquakes and a state-of-the-art 12-station telemetered network to monitor local seismicity in the environs of Tehri Dam.

2. LIST OF FACULTY MEMBERS

I. Professors

Singh Yogendra, Ph.D. (IITD)

Head

Structural Earthquake Engineering, Performance Based Design, Seismic Risk Assessment

Sharma M. L., Ph.D. (IITR)
Engineering Seismology & Seismotectonics

Kumar Ashok, Ph.D. (IITR)
Instrumentation

Sinvhal Amita (Ms.), Ph.D. (IITR) (Till June 30, 2016)
Engineering Seismology & Seismotectonics

Pal Kirat, Ph.D. (IITR) (Till June 30, 2016)
Instrumentation

Narayan J. P., Ph.D. (BHU)
Engineering Seismology & Seismotectonics

Shrikhande M., Ph.D. (IITK)
Structural Dynamics

Maheshwari B. K., Ph.D. (Japan)
Soil Dynamics

Agarwal Pankaj, Ph.D. (IITR)
Structural Dynamics

II. Associate Professors

Das, J., Ph.D. (IITR)
Seismotectonics and Remote Sensing

Jakka, Ravi Shankar, Ph.D. (IITD)
Soil Dynamics

Gupta, S.C., Ph.D. (IITR)
Seismology and Seismotectonics

III. Assistant Professors

Pandey, A.D., ME (IITR) (Till June 30, 2016)
Structural Dynamics

Shanker, Daya, Ph.D.(BHU)
Engineering Seismology & Seismotectonics

Dubey, Ramanand, Ph.D.(IITR)
Structural Dynamics

IV. Emeritus Professor

Arya, A.S. Ph.D. (Illinois)
Structural Dynamics

V. Emeritus Fellow

Paul, D. K., Ph. D. (Swansea) (Till June 30, 2016)
Soil Dynamics, Earthquake Risk Mitigation, Structural Earthquake Engineering

Kumar, Ashwani, Ph.D. (IITR)
Engineering Seismology & Seismotectonics

Wason, H. R., Ph. D. (KU) (Till June 30, 2016)
Engineering Seismology & Seismotectonics

VI. Visiting Faculty

Mukerjee, Shyamal, Ph.D. (IITR) (Till June 30, 2016)
Soil Dynamics

VII. Honorary Fellow

Gupta, I. D., Ph.D. (Pune)
Seismic Hazard Assessment, Engineering Seismology

3. HONOURS AND AWARDS TO FACULTY MEMBERS

Dr. Ashwani Kumar

- Nominated as External Expert Member of the PG board in Geophysics of Kurukshetra University for a period of 2 year from 18 November, 2016.

Dr. B. K. Maheshwari

- Visited Japan as a part of High Level Policy Dialogue on Cooperation in Education, led by Shri V.S. Oberoi, Secretary, MHRD, Govt. of India during July 6-9, 2016.
- Attended a meeting as a member of CED39 (Earthquake Engineering Section) of Bureau of Indian Standards (BIS) at New Delhi on February 27, 2017
- Visited IIT Kharagpur to examine one Ph.D. Thesis in Dept. of Geology and Geophysics on July 4, 2016.

- Invited to deliver a Key Note Lecture entitled “Geotechnical Issues and Foundation Design of Tall Buildings” in Conference Planning and Design of Tall Buildings Including Earthquake and Wind Effects Organized by Indian Association of Structural Engineers at New Delhi on December 7, 2016
- Delivered an invited key note lecture entitled “ Recent Advances in Non Linear Soil- Site Interaction for Earthquake loads” in a conference held at GNEC, IIT Roorkee on August 5, 2016
- Invited to deliver a Special Presentation Lecture entitled “Recent Advances in Nonlinear Soil-Structure Interaction for Earthquake Loads” in 6th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics held at Extension Centre, IIT Roorkee at Greater Noida on August 5, 2016

Dr. M. L. Sharma

- Chaired a session TS 6: Emergency action plan for dams towards disaster resilience, Third National Dam Safety Conference, February, 18 – 19, 2017, organized by CWC, UJVNL and IITR, MAC Auditorium, Roorkee.
- Presented a technical talk on Trends in Uttarakhand and its implications in future seismicity, in Workshop on Earthquake Risk Management, Disaster Mitigation and Management Centre, Department of Disaster Management, Government of Uttarakhand, Dehradun, Jan 20, 2017.
- Represented as National Delegate from India in Executive committee meeting of International Association of Earthquake Engineering in Santiago, Chile, Jan 09-14, 2017.
- Chaired a committee on strong motion instrumentation, BBMB, Punjab, May 19-20, 2016.

Dr Manish Shrikhande

- Invited for talk on "Earthquake Engineering Fundamentals" in the Training Programme for CPWD engineers conducted at Department of Civil Engineering, Amity University Noida on September 26, 2016.
- Invited for talk on "Reliability Levels Implied in IS-1893(2002)" at the Department of Civil Engineering, Aligarh Muslim University on October 26, 2016.

Dr. Yogendra Singh

- Member, Technology Sub-Mission on Sustainable Technological Solutions for Faster & Cost Effective Construction of Houses Suiting to Geo-Climatic and Hazard Conditions of the Country, Housing for All Mission, Ministry of Housing and Urban Poverty Alleviation, Govt. of India.

Dr Pankaj Agarwal

- Young Concrete Engineer Award 2016-17 to Mr. Amit Goyal, *Research Scholar* of Prof. Pankaj Agarwal, Department of Earthquake Engineering, IIT Roorkee for his part of Ph. D work entitled "Earthquake Resistant Interlinked Block Masonry System With Visco-Elastic Energy Dissipator Links" by Indian Concrete Institute, Chandigarh Center (Chandigarh, Punjab, Haryana, J&K, HP) on 4th March, 2017.
- Delivered a keynote lecture on the topic "Earthquake Resistant Construction based on low cost Damping Devices" in the Technical Seminar in Dehradun for Engineers, Architects & academicians in collaboration with The Institute of Engineers (Indian), Uttarakhand Architect Association and Uttaranchal Engineers and Draftsmen Associations on behalf of IEI, UAA, UEDA & UltraTech Cement, 27th March 2017.
- Invited to lecture in TEQIP Short Term Course on Structural Elements Subjected to Extreme Loadings, organized by Department of Civil engineering, IIT Roorkee, March 20-24, 2017.
- Attended a meeting to Review & Development of Standardized Information, Education & Communication (IEC) Material for Earthquake Safety and Preparedness at NDMA Bhawan, New Delhi, 21st March, 2017.
- Delivered a key note lecture on the topic "Earthquake Resistant Construction by using Visco-elastic Link Elements" in All India Seminar on "Advances in Technology to Mitigate the Effect of Natural Hazards (ATMENH-2017)" during March 2-3, 2017 at College of Technology, G. B. Pant University of Agriculture & Technology, Pantnagar (Uttarakhand).

4. PARTICIPATION OF FACULTY IN CONFERENCES/ SEMINAR/ SYMPOSIA/ WORKSHOP/GUEST LECTURES

Name of Faculty	Details of Conf. / Semi./ Symp./ Workshop/ Guest Lecture	Venue	Date
Dr. B.K. Maheshwari	16 th World Conference on Earthquake Engineering	Santiago, Chile	January 9-13, 2017
Dr. Daya Shankar	Workshop on slow Earthquake 2016 in Earthquake Research Institute	Tokyo University, Japan	September 13-15, 2016
Dr. Daya Shankar	2 nd Beijing Scientist to Scientist (S2S) workshop	Beijing, China	October 26-28, 2016
Dr. Daya Shankar	16 th World Conference on Earthquake Engineering	Santiago, Chile	January 9-13, 2017
Dr. M. L. Sharma	Workshop on probabilistic seismic hazard assessment studies of nuclear power plants, NPCIL, Mumbai	NPCIL, Mumbai	August 21-22, 2016

Dr. M. L. Sharma	16 th World Conference on Earthquake Engineering	Santiago, Chile	January 9-13, 2017
Dr. M. L. Sharma	6 th Int. Conf. on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics (6ICRAGEE)	IIT Roorkee Extension Centre, 20 Knowledge Park II, Greater Noida.	August 1- 6, 2016,
Dr. M. L. Sharma	Attended meeting at Dehradun regarding Uttarakhand Disaster Recovery Initiative (UDRP)	Dehradun	14 September, 2016.
Dr. M. L. Sharma	Attended meeting at Delhi regarding Central Water Commission (CWC)	Delhi	5 November, 2016
Dr. Ravi S. Jakka	5 th International Conference on Forensic Geotechnical Engineering	IISc, Bangalore, during	8-10 December, 2016
Dr. Ravi S. Jakka	Indian Geotechnical Conference (IGC)	IIT Madras, Chennai	15-17 December, 2016
Dr. Ravi S. Jakka	6 th Int. Conf. on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics (6ICRAGEE)	IIT Roorkee Extension Centre, 20 Knowledge Park II, Greater Noida.	August 1- 6, 2016,
Dr. R. N. Dubey	Retrofitting Methodologies	IIT Roorkee	April 2016
Dr. R. N. Dubey	16 th World Conference on Earthquake Engineering (16WCEE)	Santiago, Chile	Jan 09-13, 2017
Dr. R. N. Dubey	TEQIP Short Term Course on Recent Advances in Structural Engineering	IIT Roorkee	Feb. 20-24, 2017
Dr. S.C. Gupta	6 th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics(6ICRAGEE)	IITR Extension Centre, Greater Noida	1-6 August, 2016
Dr. Yogendra Singh	Workshop 67: EQ Resistant Design-Codal provisions, Latest Revisions and Issues related to shear Walls	Mumbai	June 3-4, 2016
Dr. Yogendra Singh	Vibration Mitigation Techniques: Theory and applications	IIT Roorkee	June 27-July 1, 2016

Dr. Yogendra Singh	Kick-off Workshop for the disaster Risk assessment of Uttarakhand	Dehradun, Uttarakhand	July 7, 2016
Dr. Yogendra Singh	Geo China 2016 International Conference	Jinan, China	July 25-27, 2016
Dr. Yogendra Singh	Second Open House Discussion on the Technology Sub-Mission under Housing for All (Urban)	BMTPC, New Delhi	August 12, 2016
Dr. Yogendra Singh	Workshop on seismic hazard assessment studies of nuclear power plants, NPCIL, Mumbai	NPCIL, Mumbai	August 22-23, 2016
Dr. Yogendra Singh	National Workshop on Advances in Repair and Rehabilitation of Concrete Structures	CSIR-CBRI, Roorkee	September 22-23, 2016
Dr. Yogendra Singh	Workshop on Earthquake Damage and Loss Estimation of Guwahati City for scenario Earthquakes	Guwahati, Assam	November 10, 2016
Dr. Yogendra Singh	Inter-Disciplinary Workshop on Seismic Resilience: Understanding Seismic Hazard and Ongoing Risk Reduction Initiatives in Bhutan	Thimphu, Bhutan	November 22-23, 2016
Dr. Yogendra Singh	Workshop on Earthquake Risk Management	Dehradun, Uttarakhand	January 20, 2017
Dr. Yogendra Singh	Workshop on EQ Resistant Design of Structures for Rural Works Department, Uttarakhand	Dehradun, Uttarakhand	March 4, 2017
Dr. Yogendra Singh	TEQIP Short Term Course on Structural Elements Subjected to Extreme Loadings	IIT Roorkee	March 20-24, 2017

5. TOTAL NUMBER OF FACULTY MEMBERS PARTICIPATED IN SHORT TERM COURSES

NATIONAL	
INTERNATIONAL	

6. DISTINGUISHED VISITORS OF THE DEPARTMENT (NATIONAL / INTERNATIONAL)

Name	Designation and Affiliation	Purpose	Dates
Prof Durgesh C Rai	Professor, Department of Civil Engineering, Indian Institute of Technology Kanpur	Technical talk on Experimental Simulation of Engineering Measures for Earthquake Preparedness: IIT Kanpur Experience	August 12, 2016
Dr Eduardo Reinoso	Instituto de Geofisica, UNAM, Mexico,	Guest Lecture on CAPRA- Probabilistic Risk Assessment Software Platform	September 28, 2016
Dr. P. D. Mathur (DHI),	Mexico	Visited Department	September 28, 2016
Dr. Manzul Hazarika (AIT)	Mexico	Visited Department	September 28, 2016
Dr. Alejandro Aguado (ERN)	Mexico	Visited Department	September 28, 2016
Dr. Carlos Avelar (ERN)	Mexico	Visited Department	September 28, 2016
Dr. Michael Meadows (ERN)	Mexico	Visited Department	September 28, 2016
Prof. Sri Krishna Singh	Professor ,Instituto de Geofisica, UNAM, Mexico	Guest Lecture on "Strong Motion in the Indo-Gangetic Plains during the 2015 Nepal Earthquake Sequence and its Estimation during Future Earthquakes"	September 28, 2016
Prof. Shamsher Prakash	Emeritus Professor, Civil Engineering Department, MST Rolla, Missouri, USA	Visiting Professor	Nov. 1-9, 2016
Dr Pankaj Pankaj	Director Edinburgh India Institute, Dean International (South Asia), The University of Edinburgh	Exploring research collaborations	February 15, 2017
Prof. M P Singh	Preston Wade Professor Emeritus,	Guest Lecture	March 16, 2017

	Department of Biomedical Engineering and Mechanics, Virginia Tech, Blacksburg, USA		
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7. (a) INTERNSHIPS BY IIT – ROORKEE STUDENTS

S. No.	Name of Student	Name of the Internships Programme	Under Graduate	Post Graduate	Name of Institute Visited	Period
1	Pratyush Jha	DAAD- IIT Master Sandwich Program		M Tech (Structural Dynamics)	Technical University of Munich Germany	Sept 2016 -March 2017

7. (b) INTERNSHIPS OFFERED TO OTHER STUDENTS IN IIT- ROORKEE

S. No.	Name of Student	Name of Supervisor	Under Graduate	Post Graduate	Name of Collaborative Institute	Period
Nil						

8. ACADEMIC ACTIVITIES ORGANIZED BY THE DEPARTMENT

Name of the Conf./ Seminar/ Symp./ Workshop	Name of the Chairman	Sponsored by	Date
Program for Uttarakhand Engineers for Retrofitting Methodology	Dr. M. L. Sharma and Dr. Manish Shrikhande	Govt. of Uttarakhand	April 5-25, 2016
Vibration Mitigation Techniques: Theory and applications	Dr. Yogendra Singh (Co-Coordinator)	IIT Roorkee	June 27-July 1, 2016
6 th International Conference on Recent advances in Geotechnical Earthquake Engineering and Soil Dynamics	Dr. H.R. Wason-Chairman, Dr. M. L. Sharma and Dr. Yogendra Singh-Co-chairman.	HP ISPL Gurgaon; SERB, DST; ARB, Mumbai; INSA, New Delhi etc	August 3-6, 2016

Workshop on Probabilistic Safety Assessment of Nuclear Power Plants, at NPCIL Mumbai	Dr. Yogendra Singh and Dr. ML Sharma	NPCIL, Mumbai	August 22-23, 2016
Indo-Norwegian Training Programme on Seismic Design of Multistorey Buildings: IS 1893 vs Eurocode 8, India Habitat Centre, New Delhi.	Dr. Yogendra Singh	NORSAR Norway and BMTPC, New Delhi	December 8-10, 2016

9. SPONSERED RESEARCH PROJECTS

S. No.	Project Status	Total No. of Projects	Amount (Rs in Lacs)
1	Completed Projects	01	239.72
2	Ongoing Projects	04	698.53
3	New Projects	03	683.95

10. SERVICE TO INDUSTRIES

a. Consultancy Project

S. No.	Project Status	Total No. of Projects	Amount (Rs in Lacs)
1	Completed Projects	02	13.80
2	Ongoing Projects	40	476.25
3	New Projects	42	490.05

b. Testing Services

S. No.	No. of Industries Served	Total Outlay (Rs. In Lacs)
		Nil

11. SUMMARY OF MAJOR SPONSORED RESEARCH SCHEMES AND CONSULTANCY PROJECTS (Rs. 20 Lacs) (A brief write up upto 100 words) (New Projects during the year 2016-2017)

DEVELOPMENT OF PSEUDO-DYNAMIC TEST FACILITY AT DEPARTMENT OF EARTHQUAKE ENGINEERING, IIT ROORKEE

A new large scale Pseudo-Dynamic/Cyclic Tests Facility with total overlay of Rs 11.00 Crores has been development. An additional grant of Rs. 4.00 Crores has been received from the Department of Science and Technology under the FIST programme to augment this facility. This facility has been designed to take up tests on full-scale structural models under simulated earthquake excitaion. The facility is very useful for calibration/verification and updating the numerical models and to evaluate efficacy of a new/innovative design concepts for enhancing the seismic resilience. The facility consists of (a) Servo-Hydraulic System (*Actuators (2 @ $\pm 500kN/250mm$ 2 @ $\pm 250kN/500mm$, Hydraulic Power Unit (400 l/min at 210 bar), Digital Compact Eight Channel Controller, Software with other related items*) (b) *Strong Floor (12 m x 10m), Reaction Wall (2 Nos of 9m x 9m) and Reaction Frame (6m x 9m with 100 tonne capacity under any combination of loads i.e. axial, flexure shear and torsion,* (c) with the 25 tonne overhead crane facility. *The test hall of facility also encompasses quasi-static testing of structural components and computerized servo-hydraulic compression and flexure testing machine.*



12. SCIENTIFIC AND TECHNICAL REPORTS

Title of the Projects	Participants	Authors	Remarks
Site specific earthquake design parameter for Durgapur T P P West Bengal	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Report on Processing and Interpretation of seismological data collected from January to December 2015 related to the project "Seismological Network	Dr. M.L. Sharma Dr. Ashwani Kumar Dr. S.C. Gupta Dr. J.P. Narayan Dr. A.K. Jindal Dr. Sanjay Jain	Dr. M.L. Sharma Dr. Ashwani Kumar Dr. S.C. Gupta Dr. J.P. Narayan Dr. A.K. Jindal	

Around Tehri region” submitted on April 2017.	Dr. Arup Sen	Dr. Sanjay Jain Dr. Arup Sen	
Study of local seismicity in the environs of Koldam site, Himachal Pradesh. A report prepared based on the data collected from May 2013 to April 2014 submitted on Jan., 2017.	Dr. M.L. Sharma Dr. Ashwani Kumar Dr. S.C. Gupta	Dr. M.L. Sharma Dr. Ashwani Kumar Dr. S.C. Gupta Dr. A.K. Jindal Dr. Sanjay Jain Dr. Arup Sen	
Report on Processing and Interpretation of seismological data collected from January to December 2014 related to the project “Seismological Network Around Tehri region submitted on June 2016	Dr. M.L. Sharma Dr. Ashwani Kumar Dr. S.C. Gupta Dr. J.P. Narayan Dr. A.K. Jindal Dr. Sanjay Jain Dr. Arup Sen	Dr. M.L. Sharma Dr. Ashwani Kumar Dr. S.C. Gupta Dr. J.P. Narayan Dr. A.K. Jindal Dr. Sanjay Jain Dr. Arup Sen	
Assessment of vibrations measurements on various buildings, submitted to DMRC Corporation Ltd., New Delhi	Dr. Y. Singh Dr. M.L. Sharma Dr. M. Shrikhande Dr. S.C. Gupta Dr. R.N. Dubey Dr. Arup Sen	Dr. Y. Singh Dr. M.L. Sharma Dr. M. Shrikhande Dr. S.C. Gupta Dr. R.N. Dubey Dr. Arup Sen	
Site specific earthquake design parameter for Kitar pur Bridge	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site specific earthquake design parameter for sonkash H E P Bhutan	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site specific earthquake design parameter for Bursar H E project site , Jammu & Kashmir	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Criteria for the dynamic analysis of steel railway bridges	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Seismic stability analyais of bhakra dam	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Seismic design parameter for Buxer T P P , Bihar	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Seismological network around tehri region “ preliminary seismological bulletin for the period jan 2016 march 2016	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	

Seismological network around tehri region “ preliminary seismological bulletin for the period April 2016 June 2016	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site specific design earthquake parameter for lipher karrali H E P , Nepal	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site specific design earthquake parameter for Marsianyndi, H E P , Nepal	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site specific design earthquake parameter for Chattru H E P, Himachal Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site specific design earthquake parameter for baryaiyaon Refinery project, Assam	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Seismological network around tehri region “ report on primary and inter potation of seismological data collected from January 2015 December 2015	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Seismological network around tehri region “ preliminary seismological bulletin for the period July 2016 September 2016	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site specific earthquake design parameter for Trincoonalli TTP Project in Sri Lanka	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Structural Stability Assessment and Development of Design Guidelines for Expended Polystyvem Core Panel System towards safe and Affordoble Hungrry	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site specific earthquake design parameter for OUT H E Project site , Arunachal Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site specific earthquake design parameter for Zunqki H E Project Nagaland	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site specific earthquake design parameter for Tizu H E Project Nagaland	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	

Site Specific Seismic Design Parameters Study for Parnai (3x12.5MW) Hydro Electric Project in Jammu & Kashmir.	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters Study for Nakthan Hydro Electric Project (520MW) in Distt. Kullu, Himachal Pradesh”.	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Seismic Design Parameters Study for Durgapur Power Plant Project -III (2x20MW) at Durgapur Steel Plant Premises in West Bengal.	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Special Investigation for Evaluation of the Seismic Forces as per the IRG-6 on major Bridges of Kiratpur Near Chowk section of NH-21 in Himachal Pradesh.	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters Study for Bunkha H.E. Project in Bhutan	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Seismic Design Parameters Study for Sankosh Hydro Electric Project, Bhutan	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Seismic Design Parameters Study for Harduaganj Thermal Power Plant Project (1x660 MW) at district Aligarh, Uttar Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters Study for Kwar Hydro Electric Project in J&K-Reg. additional Probabilistic Seismic Hazard Assessment (PSHA) Study	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters Studies for Umngot Hydro Electric Project in East Khasi Hills, District, Meghalaya, reg. updation	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters Study for Bunkha H.E. Project in Bhutan	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	

Site Specific Seismic Design Earthquake Parameters for Luhri HEP, Himachal Pradesh reg. updation	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Seismic Design Earthquake Parameters for Kirthai-I at Gulabgarh, District Kishtwar (J&K)	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Seismic Design Parameters Study for Hiramandalam reservoir of B.R.R Vamsadhara project of Phase-II of Stage-II in Srikakulam Dist of Andhra Pradesh.	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site-Specific Design Earthquake Parameter Studies for Telangana Stage –I Thermal Power Plant Project, Karimnagar, Andhra Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameter Study for Lower Kalnai HEP, District Doda, Jammu & Kashmir	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters Study for Upper Marsyangdi Hydro Electric Project in Nepal -Reg. additional Probabilistic Seismic Hazard Assessment (PSHA) Study	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters Study for Upper Karnali Hydro Electric Project in Nepal -Reg. additional Probabilistic Seismic Hazard Assessment (PSHA) Study.	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters Study for Chhatru HEP in Distt Lahaul & Spiti in Himachal Pradesh- reg. updation	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Seismic Design Parameters Study for New Project from Indian Oil Corporation Limited,	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	

Bongaigaon Refinery, Dist. Chirang in Assam			
Site Specific Seismic Design Earthquake Parameters Study for Oju Hydro Electric Project (about 1878MW), Arunachal Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Seismic Design Parameters Study for Vrindavan Chandrodaya Mandir at Vrindavan, District Mathura Uttar Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for Lohri Stage – 1 H.E Project Site, Himachal Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for 93 Mw. New Ganderbal H.E Project Site, Jammu & Kashmir	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for UMNGOI H.E.P. Site, Meghalya	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for Kirthai-1 H.E Project Site, Jammu & Kashmir	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for Phangchu H.E Project, Arunachal Pradesh.	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for New Melling Tawang H.E Project, Arunachal Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for RHO Twang Basin H.E.P, Arunachal Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for MAGO- CHU H.E Twang, Arunachal Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for Nakthan H.E.P, Himachal Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for Sankosh H.E.P in Bhutan.	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	

Site Specific Design Earthquake Parameters for Kwar H.E. P Jammu & Kashmir	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for UMNGOI H.E.P. Site, Meghalya	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for Bunkha H.E.P. in Bhutan	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for Lohri Stage-1 H.E.P in Himachal Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for Hiramandlom Reservoir Site of B.R.R Vamsadhara Project Phase – II Srinakulam (A.P)	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for Phangchung H.E.P in Arunachal Pradesh	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for 93 Mw New Ganderbal H.E.P, Jammu & Kashmir	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for Parnai H.E.P Site, Jammu & Kashmir	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters for Nakthan H.E.P	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
Site Specific Design Earthquake Parameters Study for Bursan H.E Project, Jammu & Kashmir	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	
New Melling H.E.P RHO NYOKCHAPONG- CHU MAGO- CHU	Earthquake Engineering Department Faculty	Earthquake Engineering Department Faculty	

(a) Scientific/technical reports prepared under Sponsored Research Projects

1. Kumar. A., A.D. Pandey, M.L. Sharma, J.P. Narayan and S.C. Gupta, EQ: 2017-04 (2017), "Seismological Network Around Tehri Region, (from July 2016 to Sept 2016), Department of Earthquake Engineering, IIT Roorkee
2. Kumar. A., A.D. Pandey, M.L. Sharma, J.P. Narayan and S.C. Gupta, EQ: 2016-21 (2016), "Seismological Network Around Tehri Region, (from April 2016 to June 2016), Department of Earthquake Engineering, IIT Roorkee

3. Kumar. A., A.D. Pandey, M.L. Sharma, J.P. Narayan and S.C. Gupta, EQ: 2016-18 (2016), "Seismological Network Around Tehri Region, (from Jan 2016 to Mar 2016), Department of Earthquake Engineering, IIT Roorkee

(b) Scientific/technical reports prepared under Consultancy Projects

1. Sharma. M.L., M. Shrikhande, J. P. Narayan, B. K. Maheshwari, J. Das and Daya Shanker, EQ: 2017-06 (2017), Site Specific Earthquake Parameters for Nyera Amari Project, Bhutan, Department of Earthquake Engineering, IIT Roorkee
2. Sharma. M.L., M. Shrikhande, J. P. Narayan, B. K. Maheshwari, J. Das and Daya Shanker, EQ: 2017-05 (2017), Site Specific Earthquake Parameters for Trincomalli TPP Project, Srilanka, Department of Earthquake Engineering, IIT Roorkee
3. Sharma. M.L., M. Shrikhande, J. P. Narayan, B. K. Maheshwari, J. Das and Daya Shanker, EQ: 2017-01 (2017), Site Specific Earthquake Parameters for Chhatru HE Project, Himachal Pradesh, Department of Earthquake Engineering, IIT Roorkee
4. Sharma. M.L., M. Shrikhande, J. P. Narayan, B. K. Maheshwari, J. Das and Daya Shanker, EQ: 2016-24 (2016), Site Specific Earthquake Parameters for Upper Marsiangndi HE Project, Nepal, Department of Earthquake Engineering, IIT Roorkee
5. Sharma. M.L., M. Shrikhande, J. P. Narayan, B. K. Maheshwari, J. Das and Daya Shanker, EQ: 2016-23 (2016), Site Specific Earthquake Parameters for Upper Karnali HE Project, Nepal, Department of Earthquake Engineering, IIT Roorkee
6. Sharma. M.L., M. Shrikhande, J. P. Narayan, B. K. Maheshwari, J. Das and Daya Shanker, EQ: 2016-22 (2016), Site Specific Earthquake Parameters for Lower Kalnai HE Project, Jammu & Kashmir, Department of Earthquake Engineering, IIT Roorkee
7. Sharma. M.L., M. Shrikhande, J. P. Narayan, B. K. Maheshwari, J. Das and Daya Shanker, EQ: 2016-14 (2016), Site Specific Design Earthquake Parameters for Bursar HE Project, Jammu & Kashmir, Department of Earthquake Engineering, IIT Roorkee

13. RESEARCH PUBLICATION

S. No.	Details	Total Number
A	Conference/ Symposium/ Seminars	07
B	International Conference	20
C	National journals	04
D	International Journals	34

Research publication during the year under report (to be listed on the basis of first author only, as given below) **Separate group for Conference/ Symposium/ Papers and Books/ Monographs be made.**

a. Conference/ Symposium/ Seminars

1. Agarwal, J. and Jakka, R.S. (2016), "Investigations on a Geosynthetic Reinforced Bearing Layer under Static and Dynamic Loading", Indian Geotechnical Conference IGC2016, Chennai, India, 15-17 December, paper no. 201, pp. 1-4.
2. Bhaduri A. and Maheshwari B.K., "Effects of Discontinuities on Rock Slope" Proc. of the Indian Geotechnical Conference, IIT Madras, Chennai, December 2016.
3. Bharathi, M., Raj, Dhiraj, Dubey, R.N., and Mukerjee, S., Numerical Simulation of Dynamic Vertical Tests on Piles, Sixth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, August 01-06, 2016, Greater Noida, India.
4. Kaloni S. and Shrikhande M., "Blind source separation based system identification of earthquake excited structures", In Proceedings of ISSS National Conference on MEMS, Smart Materials, Structures and Systems, September 28–30, Indian Institute of Technology Kanpur, India, 2016.
5. Kumar N. and J.P. Narayan (2016) A numerical prediction of fundamental frequency of 2D basins with large shape-ratio, Conference: 1st Triennial Congress of FIGA, 53rd Annual Convention of IGU & 34th Annual Convention of AHI, At IIT (ISM) Dhanbad, November, 2016.
6. Pandey, B., Jakka, R.S. and Kumar, A. (2016), "Study of Local Site Effects for Strong Motion Recording Stations of Delhi", Indian Geotechnical Conference IGC2016, Chennai, India, 15-17 December, paper no. 446, pp. 1-4.
7. Shrimal D. and Maheshwari B.K., "Effect of Liquefaction on the Response of a Single Pile under Seismic Loading" Proc. of the Indian Geotechnical Conference, IIT Madras, Chennai, December 2016.

b. International Conference

1. Joytima Kanaujia, Ashwani Kumar and S.C. Gupta, (2016), Mapping the crustal thickness in Garhwal Himalaya using Moho reflected seismic phases. 6th International conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, held on Aug. 1-3, 2016, IITR Roorkee Greater Noida Campus
2. Das, Ranjit, D. Choudhury, M. L. Sharma and H. R. Wason (2016) Uncertainty Analysis for Seismic Hazard- A Case Study for Northeast India. 6th Int. Conf. on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics (6ICRAGEE), August 1- 6, 2016, IIT Roorkee Extension Centre, 20 Knowledge Park II, Greater Noida.
3. Dubey, R.N., and Bharathi, M., Dynamic Response of Batter Piles, 16th World Conference on Earthquake Engineering, January 09-13, 2017, Santiago, Chile.
4. Jakka, R.S., Pandey, B., Kumar, A. and Gupta, A.K. (2016), "Local Site Effects at Strong Motion Recording Stations of Delhi", 6th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, Greater Noida, India, 1-6 August, paper no. 191, pp. 1-7.
5. Jose, P., Jakka, R.S. and Pandey, A.D. (2016), "Machine Foundations: A Review of Failures", Proceedings of 5th International Conference on Forensic Geotechnical Engineering, Bangalore, India, 8-10 December, pp. 264-270.

6. Kirar B. and Maheshwari B.K. (2017), "Dynamic Properties of Solani Sand at Small Strains using Resonant Column Apparatus" Proc. of 16th World Conference on Earthquake Engineering, Santiago, Chile, Jan. 2017.
7. Kumari, Neha, M. L. Sharma and I. D. Gupta (2017) Stochastic simulation of strong ground motions for western Himalaya region, 16 World Conference on Earthquake Engineering, Santiago, Chile Jan 09-14, 2017.
8. Kuri, Manoj, Atanu Bhattacharya, Manoj K Aroora and M. L. Sharma (2016). Time series insar techniques to estimate deformation in a landslide-prone area in Haridwar region, India, Geoscience and Remote Sensing Symposium (IGARSS), 2016 IEEE, 6839-6842.
9. Mridula, A. Sinvhal, H. R. Wason and Rajput S. S. (2016), Segmentation of Main Boundary Thrust and Main Central Thrust in Western Himalaya for assessment of seismic hazard, Natural hazards, 84: 383, doi: 10.1007/s11069-016-2424-8.
10. Nath, R. R., A. D. Pandey and M. L. Sharma (2016) Static and dynamic analysis of a Tailings dam, CESDOC 2016.
11. Padalu, P. K. V. R., Singh, Y., and Das, S. (2016). "Numerical Modelling of the Seismic Behaviour of URM Walls under Out-of-Plane Action: A Literature Review", Proceedings of International NAFEMS Conference (NAFEMS 3D), Engineering Modelling, Analysis, and Simulation, August 29-31, 2016, NAFEMS, Bengaluru, India. pp. 74.
12. Padalu, P. K. V. R., Singh, Y., and Das, S. (2016). "Seismic Safety Assessment of an Unreinforced Masonry Building: A Case Study", Proceedings of International NAFEMS Conference (NAFEMS 3D), Engineering Modelling, Analysis, and Simulation, August 29-31, 2016, NAFEMS, Bengaluru, India. pp. 47.
13. Rajput, S. S., Mridula, Sinvhal, A., Wason, H. R. and Dixit, P. (2016), "Seismic Hazard and Risk Assessment in Kangra Seismogenic Source Zone", 6th International Conference on Recent Advances in Geotechnical Earthquake Engineering & Soil Dynamics, Noida, India, August 3-5, 2016.
14. Roy, N., Jakka, R.S. and Wason, H.R., (2016), "Surface Wave Data Uncertainty and Its Consequence on Seismic Design Ground Motion", 6th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, Greater Noida, India, 1-6 August, paper no. 120, pp. 1-6.
15. Saran S., D. Shanker and Tinku Biswas (2016), Proportioning of a strip footing located in seismic region using non-linear constitutive law of sand. Proceedings of Sixth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics August 1 – 6, 2016, IIT Roorkee Extension Centre, 20 Knowledge Park II, Greater Noida, India.
16. Shanker D. (2016). Seismic cycle and escort for the occurrence of large earthquakes. Joint Workshop on slow Earthquake 2016. Tokyo, Japan from 13-15 September, 2016, page 53, I32, 2016
17. Shanker D., Paudyal, H. and Singh, H.N. (2017). Earthquake Precursor and forecast in South Central Tibet Region of Himalaya. Proceeding of 16th World Conference on Earthquake Engineering, Santiago, Chile, January 9-13, 2017.

18. Sharma, M. L. (2016) Geophysical techniques in geotechnical earthquake engineering, 6th Int. Conf. on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics (6ICRAGEE), August 1- 6, 2016, IIT Roorkee Extension Centre, 20 Knowledge Park II, Greater Noida.
19. Sharma, M. L. (2016) Seismic hazard assessment – near source effects a NGA2 West perspective, One day workshop on probabilistic seismic hazard assessment for Nuclear Power Plants, NPCIL, Bombay, August 21-22, 2016.
20. Shukla, R.P. and Jakka, R.S., (2016), “Seismic Bearing Capacity of Skirted Footing on Slope”, 6th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, Greater Noida, India, 1-6 August, paper no. 174, pp. 1-6.

c. National Journals

1. Halder P., Singh Y. and Paul D. K. (2016), “Simulation of Infills for Seismic Assessment of Open Ground Storey RC Frame Buildings” Journal of Structural Engineering, CSIR-SERC Chennai, Vol. 43, No. 1, May 2016, pp. 60-68.
2. Kanika Sharma, A.K. Saraf, J. Das, S. S. Baral, S. Borgohain and G. Singh (2016) Mapping and Change Detection Study of Nepal-2015 Earthquake Induced Landslides, Indian Society of Earthquake Science, 5, 2-4.
3. Roy T. and Agarwal P., (2016) “Comparison of Damage Index and Fragility Curve of RC Structure Using Different Indian Standard Codes”, Journal of Structural Engineering (CSIR-SERC); Vol.43, No.1, pp.1- 09.
4. Surana M., Singh Y., and Lang D. H. (2016), “Seismic Performance of Mid-rise RC Frame and Frame-shear Wall Buildings Designed for Indian Codes” Journal of Structural Engineering, CSIR-SERC Chennai, Vol. 43, No. 1, May 2016, pp. 43-50.

d. International Journals

1. Ansari, Md. I. and Agarwal, P. (2016) “Rehabilitation Technique for Severely Damaged Concrete Gravity Dam,” Practice Periodical on Structural Design and Construction (ASCE), DOI: 10.1061/(ASCE)SC.1943-5576.0000287.
2. Ansari, Md. I. and Agarwal, P. (2016). “Comparison of Damage Indexes Proposed for a Concrete Gravity Dam,” International Journal of Dam Engineering, Vol. XXXVIII, Issue 2, PP 01-15.
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4. Baby A. and Shrikhande M., “Wavelet packet characterization of scenario earthquake ground motions”, Journal of Earthquake & Tsunami, 11(2):1750006-1--175006-23, 2017.
5. Bhardwaj, Rakhi, M. L. Sharma, Ashok Kumar (2016) Multi-parameter algorithm for Earthquake Early Warning, Geomatics, Natural Hazards and Risk, pp. 1242-1264.
6. Biswas T., Swami Saran, Daya Shanker, (2016). Analysis of a Strip Footing Using Constitutive Law. Geosciences Vol. 6, NO. 2, 41-44, 2016

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13. Goyal A. & Agarwal P. (2017) "Use of Co-Polymer of Styrene Butadiene Rubber-A Seismically Innovative Approach towards Energy Dissipation" *Procedia Engineering (Elsevier)*, 173 (2017) 1800 – 1807.
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15. Joytima Kanaujia, Ashwani Kumar and S.C. Gupta, (2016), Three-dimensional velocity structure around the Tehri region of the Garhwal Lesser Himalaya: constraints on geometry of the underthrusting Indian plate. *Geophys. J. Int.*, 205(4), 900–914, Doi 10.1093/gji/ggw056
- Ansari, Md. I. and Agarwal, P. (2016) "Categorization of Damage Index of Concrete Gravity Dam for the Health Monitoring after Earthquake," *Journal of Earthquake Engineering (Taylor & Francis)*, Vol. 20, pp 1222-1238, DOI:10.1080/13632469.2016.1138167
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18. Mittal H., Ashok Kumar, Yih-Min Wu, Kamal, and Arjun Kumar (2016) Source study of Mw 5.4 April 4, 2011 India–Nepal border earthquake and scenario events in the Kumaon–Garhwal Region, *Arabian Journal of Geoscience*, *Arab J Geosci* (2016) 9:348; DOI:10.1007/s12517-016-2330-0; April 2016.
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20. Narayan J.P., P.K. Singh and Kamal (2016) Study of role of various parameters affecting the characteristics of basin generated surface waves and associated spatial variation of ground motion in 2D basins, *Int. Jr. Geo-Engg.*, 7, 1-19 (DOI, 10.1186/s40703-016-0031-x)
21. Pandey B., Jakka R. S., Kumar A. and Mittal H. (2016) Site Characterization of Strong-Motion Recording Stations of Delhi Using Joint Inversion of Phase Velocity Dispersion and H/V Curve *Bulletin of the Seismological Society of America*, Vol. 106, no. 3; May 2016, DOI: 10.1785/0120150135
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26. S. Borgohain, J. Das, A.K. Saraf, G. Singh & S.S. Baral (2017) Structural controls on topography and river morphodynamics in Upper Assam Valley, India, *GeodinamicaActa*, 29:1, 62-69, DOI: 10.1080/09853111.2017.1313090
27. Sherif M. ALI, D. Shanker, (2017). Study of seismicity in the NW Himalaya and adjoining regions using IMS network. *Journal of Seismology*; Volume 21, Issue 2, pp 317–334 (2017)
28. Shermi, C., and Dubey, R.N., Study on Out-of-Plane Behavior of Unreinforced Masonry Strengthened with Welded Wire Mesh and Mortar, *Construction and Buildings Materials*, Vol. 143 (2017): pp. 104-120.
29. Shukla, R.P. and Jakka, R.S. (2017), "Discussion on 'Experiential and Numerical Studies of Circular Footing Resting on Confined Granular Subgrade Adjacent of Slope'", *ASCE-International Journal of Geomechanics*, 17 (2):1-3.
30. Subhajit Sen and Yogendra Singh (2016), "Displacement-Based Seismic Design of Flat Slab-Shear Wall Buildings," *Earthq. Eng. & Eng. Vib.* Vol. 15. No. 2, pp. 209-221.
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34. VVS Surya Kumar Dadi, and Agarwal, Pankaj (2016) "Nonlinear Cyclic Performance Evaluation of Soft Storey RC Frame Buildings Based on Different Characteristics of Reinforcement" *KSCE Journal of Civil Engineering* (Springer), March 2016, Volume 20, Issue 2, pp 738–746