



Outreach & Dissemination Services Office
CSIR – Central Building Research Institute

Roorkee – 247667 (UK)

Training Program on

‘Earthquake Retrofitting Techniques and DPR Preparation’

23rd-27th February, 2026

Organized under the aegis of CSIR Integrated Skill Initiative

The CSIR–Central Building Research Institute (CSIR-CBRI), Roorkee, in collaboration with the Himachal Pradesh State Disaster Management Authority (HPSDMA), has conducted a five-day advanced Skill Development Training Programme on “**Earthquake Retrofitting and Disaster Preparedness Report (DPR) Preparation**” from **23-27 February 2026** under the CSIR Skill Development Initiative, the training was coordinated by **Er. Ashish Pippal**, Principal Scientist, CSIR-CBRI. The programme aims to strengthen professional capacity for the development of earthquake-safe and disaster-resilient infrastructure. A total of **30 participants from different districts of Himachal Pradesh** are taking part in the programme. The participants include engineers and technical professionals engaged in planning, design, on site retrofitting and implementation of infrastructure projects in seismically vulnerable regions.



कौशल विकास कार्यक्रम

“भूकंप रेट्रोफिटिंग तकनीकियाँ एवं विस्तृत परियोजना रिपोर्ट (DPR) की तैयारी”

Skill Development Programme on

“**Earthquake Retrofitting Techniques and DPR Preparation**”

Sponsored by: Himachal Pradesh State Disaster Management Authority (HPSDMA)

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सीएसआईआर – केन्द्रीय भवन अनुसंधान संस्थान, रुड़की
CSIR – Central Building Research Institute, Roorkee
Ministry of Science & Technology, India





Marking a historic milestone, **CSIR–Central Building Research Institute (CSIR-CBRI), Roorkee** conducted, for the **first time**, a special on-site practical demonstration of live house retrofitting under the expert guidance of its scientists. This pioneering initiative reflects the Institute’s national leadership in disaster mitigation research and its strong commitment to translating advanced scientific expertise into real-world field applications, thereby significantly strengthening the hands-on technical capacity of engineers and professionals.



The inaugural session was graced by eminent scientists and experts including **Prof. R. Pradeep Kumar, Director, CSIR-CBRI**; **Dr. D. P. Kanungo**, Chief Scientist; **Dr. Ajay Chaurasia**, Chief Scientist; **Dr. Neeraj Jain**, Senior Principal Scientist and ODS Head; and **Er. Ashish Pippal**, Principal Scientist and Training Coordinator. Welcoming the participants, **Er. Ashish Pippal** highlighted CSIR-CBRI's mandate, state-of-the-art research facilities, and its significant contributions toward **disaster-resilient infrastructure development**. **Dr. Neeraj Jain** elaborated on the objectives of the programme under the CSIR Skill Development Initiative, emphasizing capacity building, sustainable development, and alignment with the national vision of "Atmanirbhar Bharat." **Dr. Ajay Chaurasia** outlined the Institute's initiatives in strengthening earthquake resilience in Himachal Pradesh through DPR preparation and scientifically validated retrofitting strategies, while **Dr. D. P. Kanungo** spoke on earthquake mechanisms, seismic hazards, and disaster mitigation approaches. Addressing the gathering, **Prof. R. Pradeep Kumar** underscored the critical importance of evidence-based retrofitting techniques and earthquake safety measures to reduce loss of life and property in seismically vulnerable regions, particularly encouraging participants to apply these technologies at the grassroots level in states like Himachal Pradesh.



The Day One of the training programme, a technical lecture was delivered by **Dr. Ajay Chourasia, Chief Scientist, CSIR-CBRI**, on **Design of earthquake-resistant buildings for Hills**, highlighting the unique challenges of slope, soil instability, and amplified seismic forces. He emphasized proper site selection, safe foundation design, and slope stabilization. The importance of regular building configurations, lightweight materials, and adequate lateral load-resisting systems was discussed. He also pointed out common construction deficiencies and stressed adherence to Indian Standards for ensuring structural safety in seismic-prone hill areas.



Day 2:

On the second day of the training programme, a lecture was delivered by **Er. H. K. Jain, Retired Senior Technical Officer**, on **Quality Assurance and Control (QA/QC)**. He explained the importance of systematic quality planning, material testing, and process monitoring to ensure durability and safety of structures. The session highlighted the difference between quality assurance (preventive measures) and quality control (inspection and testing). He also emphasized adherence to standards, proper documentation, and on-site supervision for achieving high construction quality.



The Second lecture was delivered by **Er. M. M. Dalbehera, Principal Scientist, on Construction Technologies for Hilly Regions**, focusing on the challenges posed by steep slopes, difficult terrain, and seismic vulnerability. He discussed suitable foundation systems, slope stabilization measures, and the use of lightweight and locally available materials. Emphasis was laid on safe construction practices, proper drainage planning, and structurally efficient configurations. The session provided practical insights into developing resilient and sustainable infrastructure in hill areas.



The third technical lecture was delivered by **Dr. Anindya Pain, Senior Principal Scientist, on Design and Construction of Foundations in Hills**. He highlighted the geotechnical challenges associated with slopes, varying soil strata, and seismic forces. The session emphasized proper site investigation, selection of suitable foundation systems, and slope stability analysis. He also discussed drainage management and reinforcement measures to ensure safe and durable foundation performance in hill regions.



Lab Visits



Retrofitting site Visit



Day 3:

The First & second lecture on the third day of the training programme was delivered by **Er. Ashish Kapoor, Senior Scientist**, on the **Use of non-destructive testing methods in structural assessment** focused on techniques such as rebound hammer, ultrasonic pulse velocity, and correlation methods to evaluate the strength and integrity of existing structures without causing damage. The importance of condition assessment for identifying cracks, deterioration, and structural deficiencies was highlighted for ensuring safety and serviceability and second lecture on **Design of Retrofitting measures** emphasized strengthening strategies for structurally deficient and earthquake-vulnerable buildings. It covered methods such as jacketing, addition of shear walls, bracing systems, and foundation strengthening. The session stressed the need for proper assessment, analysis, and adherence to relevant codes for effective and durable retrofitting solutions.



Rural Park visit:



Retrofitting site Visit:



Day 4:

The first lecture was delivered by **Er. Ashish Pippal, Principal Scientist**, on **Landslide observation and Control Measures**. He discussed the causes and triggering factors of landslides in hilly regions, including slope instability, water infiltration, and unplanned construction activities. The session highlighted preventive and corrective measures such as proper drainage systems, retaining structures, slope reinforcement, and bio-engineering techniques. He emphasized the importance of scientific planning and regular monitoring to minimize landslide risks and ensure safe development in hill areas.



Er. I.A. Siddiqui, Sr. Technical Officer delivered an insightful lecture on **Construction Cost Management and Recent Trends in DPR Preparation**. He highlighted the importance of accurate cost estimation, budgeting, rate analysis, and financial monitoring to ensure project efficiency and transparency. The session also covered modern approaches in Detailed Project Report (DPR) preparation, including data-driven planning, risk assessment, sustainability considerations, and compliance with updated standards and guidelines.



Retrofitting site and Demonstration park visit:



Following the technical sessions, the participants were taken for a comprehensive field exposure visit that included live retrofitting sites, various advanced laboratories of CSIR-CBRI, the Demo Park, and the Rural Technology Park. This integrated exposure provided a holistic understanding of building science, ranging from laboratory-scale material testing and structural evaluation to full-scale demonstration of retrofitting techniques and cost-effective rural housing technologies.

At the retrofitting sites, participants observed practical strengthening measures, seismic safety interventions, and on-site execution challenges, which complemented the theoretical concepts discussed during the sessions. The visits to specialized laboratories showcased standardized testing procedures, quality assurance mechanisms, and cutting-edge research facilities, while the Demo Park and Rural Park highlighted innovative, sustainable, and region-specific construction technologies in action. Interaction with scientists, engineers, and field experts enabled participants to appreciate multidisciplinary aspects of construction, disaster mitigation, fire safety, geotechnical engineering, and sustainable housing practices.

Day 5:

The first lecture was delivered by **Er. Sugam Prajapati, Technical officer**, on the **Preparation and Understanding of Technical Drawings**. He explained the fundamentals of reading and interpreting architectural and structural drawings, including plans, elevations, sections, and detailing. The session emphasized standard symbols, scales, dimensions, and notations used in construction drawings. He also highlighted the importance of accuracy and coordination among drawings for effective execution at site.



The second lecture was delivered by **Ar. S.K. Negi, Retired Chief Scientist, CSIR-CBRI**, delivered a lecture on **Building Bye-Laws for Himachal Pradesh**. He explained the key provisions related to land use, building height, setbacks, structural safety, and disaster resilience specific to hilly regions. The session highlighted regulatory requirements for seismic safety, environmental considerations, and approval procedures. He emphasized strict compliance with bye-laws to ensure planned, safe, and sustainable development in the state.



The third lecture was delivered by **Dr. Shailesh Agrawal, Former Ex. Director (BMTPC)/Rt. Sr. Principal Scientist CSIR-CBRI on Emerging Technologies for a Better Built Environment.** The lecture highlighted recent technological advancements in the construction sector, including smart materials, digital design tools, automation, and sustainable technologies, emphasizing their role in improving efficiency, resilience, and sustainability of the built environment.





Valediction

The training programme concluded with a **valedictory ceremony**, during which Prof. R. Pradeep Kumar, Director, CSIR-CBRI, Dr. Neeraj Jain, Senior Principal Scientist and ODS Head; Dr. Shailesh Agrawal, Former Ex. Director (BMTPC)/Rt. Sr. Principal Scientist CSIR-CBRI and Ar. S.K. Negi, Retired Chief Scientist, CSIR-CBRI, distributed **certificates to the participants** at the same retrofitting site recognising their successful completion of the training programme.







 Training Programme for “Earthquake Retrofitting Techniques and DPR Preparation” Sponsored by: Himachal Pradesh State Disaster Management Authority (HPSDMA) February 23-27, 2026 Training Schedule 					
Hours	23.02.2026	24.02.2026	25.02.2026	26.02.2026	27.02.2026
9:30 AM	Visit to Retrofitting site <i>Er. Rajnish</i>	Recapitulation of 1 st Day	Recapitulation of 2 nd Day	Recapitulation of 3 rd Day	Recapitulation of 4 th Day
10:00-11:00		Quality Assurance and Control <i>Er. H.K. Jain</i>	Use of Non-Destructive Testing Methods in Structural Assessment <i>Er. Ashish Kapoor</i>	Landslide observation and Control Measures <i>Er. Ashish Pippal</i>	Preparation & Understanding of Technical Drawings <i>Er. Sugam Prajapati</i>
11:00	<i>Tea Break</i>				
11:15-12:15	Registration & Inauguration – <i>Director, CBRI</i>	Construction technologies for hilly region <i>Er. M.M. Dalbehera</i>	Design of Retrofitting Measures <i>Er. Ashish Kapoor</i>	Construction cost management & recent trends in DPR Preparation <i>Er. I.A. Siddiqui</i>	Building Bye-Laws for Himachal Pradesh <i>Ar. S.K. Negi</i>
12:15-13:15		Design and Construction of Foundations in Hills <i>Dr. Anindya Pain</i>			Emerging technologies for better built environment <i>Dr. Shailesh Agrawal</i>
13:15-14:15	<i>Lunch Break</i>				
14:15-15:15	Design of Earthquake-Resistant Buildings for Hills <i>Dr. Ajay Chourasia</i>	Visit to Laboratories <i>Er. Rajat</i>	Visit of Rural Technology Park <i>Ar. Rashi Sharma</i>	Visit to Retrofitting site <i>Er. Rajnish</i>	Feedback, Discussion & Valediction
15:15	<i>Tea Break</i>				
15:45-17:30	Visit to Laboratories <i>Er. Anuj</i>	Visit to Retrofitting site <i>Er. Rajnish</i>	Visit to Retrofitting site <i>Er. Rajnish</i>	Visit to Construction Demonstration Park	

Schedule

List of Participates

No.	Name	Designation
1.	Sh. Sandeep Kumar	Technical Assistant
2.	Sh. Raj Kumar	Junior Engineer
3.	Sh. Bhagat Ram	Junior Engineer
4.	Sh. Mohit Rana	Junior Engineer
5.	Sh. Deepak Verma	Junior Engineer
6.	Sh. Sanjay Kumar	Junior Engineer
7.	Sh. Satish Kumar	Junior Engineer
8.	Sh. Aditya Chauhan	Junior Engineer
9.	Sh. Praveen Chauhan	Junior Engineer
10.	Sh. Brijesh Sharma	Junior Engineer
11.	Sh. Dev Raj (M)	Technical Assistant
12.	Er. Nagendra Singh	Junior Engineer
13.	Er. Vinay Kumar	Junior Engineer
14.	Er. Ramesh Chand	Junior Engineer
15.	Er. Sushil Kumar	Junior Engineer
16.	Sh. Gaurav Sharma	Junior Engineer
17.	Sh. Gulshan	Junior Engineer
18.	Sh. Avinash	Assistant Engineer
19.	Sh. Brijesh Singh	Junior Engineer

20.	Sh. Aradhya	Junior Engineer
21.	Sh. Ajay Thakur	Junior Engineer
22.	Sh. Pankaj Mahajan	Junior Engineer
23.	Sh. Deshraj	Junior Engineer
24.	Sh. Lakhu Ram	Junior Engineer
25.	Sh. Pradeep Kaushal	Junior Engineer
26.	Sh. Sanjay Soni	Junior Engineer
27.	Sh. Ashok Kumar	Junior Engineer
28.	Sh. Praveen Kumar	Junior Engineer
29.	Sh. Manohar Lal	Junior Engineer
30.	Sh. Deyraj	Tech. Assistant

