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SUMMARY: RESEARCH USING LARGE-SCALE SHAKING TABLE

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Forum topics		
	☐ Energy in 21st Century	☐ Cultural Heritage in Digital World
	☐ Engineering Capacity Building	☒ Disaster Risk Management & Governance for Resilient Communities
	☐ Construction 4.0	☐ BIM Lifecycle, Facility & Asset Management

Abstract: (250 to 500 words: for each heading use the bullet points or narrative - the submission including graphics should not exceed one page)

Problems - Issues / Challenges-Needs	The Hyogoken Nanbu (Kobe) earthquake (January 17, 1995) took lives of about 6,500 citizens and destroyed over thousands of houses in Kobe and surrounding cities. Its direct economic loss was expected to be about 10 trillion JPY (approximately 100 billion USD) that was the largest loss in Japan. To investigate the realizably collapse mechanism, a three-dimensional and full-scale earthquake testing facility commonly referred to as "E-Defense" was constructed.
Solutions - Methods / Results - Findings	E-Defense, Japanese National Research Institute for Earth Science and Disaster Resilience (NIED), is an internationally well-known earthquake testing facility that has the world largest three-dimensional shaking table (size: 20 m × 15 m and maximum loading capacity: 12,000 kN). E-Defense has been nationally and internationally contributing to earthquake and structural engineering via execution of over ninety experiments since its commencement in 2005. In this paper, we introduce about E-Defense and summarize the following experiment activities: 1) highly earthquake-resistant Japanese wooden house (2005), 2) three-storey RC school building (2006), 3) Complete collapse test of a four storey steel frame (2007), 4) Lower parts of a high-rise building (2008~2009), 5) Four types of dampers in a steel structure (2009), 6) Four-Story Reinforced Concrete and Post-Tensioned Concrete Buildings (2010), and 7) Large-space structure with suspended ceiling (2013)
Novelty - Value / Relevance to ...	E-Defense has accumulated experience and special techniques by operating large-scale shaking table tests and various types of experiments. By using E-Defense, the following issues were confirmed: 1) collapse mechanism from complete collapse tests, 2) seismic behavior of non-structural components form tests of non-structural components, and 3) seismic behavior of high-rise buildings form substructure shaking table tests of high-rise buildings.
Forum statement	To prevent the future disasters, researchers of E-Defense are currently investigating about new testing methodologies and efficient sensing techniques for experiments targeting on more complicated systems such as soil-foundation-structure.

Keywords: (up to 5 keywords)

Large-scale shaking table; E-Defense; Collapse test

Graphics: (please use the gray area bellow for *representative graphics* or *graphical summary*: select the gray area bellow and paste your graphics)

Large-Scale Shaking Table (E-Defense) Test

Timber Structures | **Reinforced concrete Structures** | **Steel Structures**