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Sommario/riassunto	This eBook is the fourth in a series of books on the critical earthquake response of elastic or elastic-plastic structures under near-fault or long-duration ground motions, and includes six original research papers which were published in the specialty section Earthquake Engineering in 'Frontiers in Built Environment'. Several extensions of the first eBook, the second eBook and the third eBook are included here. The first article is on the comparison of earthquake resilience of various building structures including innovative base-isolation systems and control systems. Pulse-type ground motions and resonant harmonic ground motions are used for investigating the earthquake resilience of those innovative building structures. The second article is concerned with the performance of an innovative seismic response controlled system with shear walls and concentrated dampers in lower stories. The resonant one-cycle sine waves and resonant harmonic waves are used as the input ground motions. The third article is related to the robustness evaluation of a base-isolation building-connection hybrid controlled building structure under the critical long-period and long-duration ground motion. The multi impulse is used as a substitute for a long-period and long-duration ground motion and the model reduction to a single-degree-of-freedom (SDOF) system is conducted to propose a simple response evaluation method. The fourth article is an extension of the previously proposed energy balance approach to a damped bilinear hysteretic SDOF system under a double

impulse as a substitute for a near-fault ground motion. The energy absorption through viscous damping is incorporated appropriately in the energy balance and the application of the proposed method to actual recorded ground motions is presented. The fifth article is on the robustness evaluation of base-isolation building-connection hybrid controlled building structures considering uncertainties in deep ground. The earthquake ground motion amplitude at the earthquake bedrock is evaluated by the Boore's stochastic method in 1983 including the fault rupture and the wave propagation into the earthquake bedrock. Then the phase angle property at the earthquake bedrock is investigated by introducing the concept of phase difference which is defined for each earthquake type. A wave at the ground surface nearly resonant to the base-isolation building-connection hybrid controlled building structure is produced by considering uncertainties in deep ground. The sixth article is concerned with the critical response of nonlinear base-isolated buildings considering soil-structure interaction under a double impulse as a substitute for a near-fault ground motion. The complicated model of a nonlinear base-isolated building on ground is modeled into an SDOF system after a few model reduction processes. The approach presented in this eBook, together with the previous eBooks, is an epoch-making accomplishment to open the door for simpler and deeper understanding of structural reliability and resilience of built environments in the elastic-plastic and nonlinear range.