

Draft How-to Guide for Seismic Instrumentation of Hospitals

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(Target 10-14 pages + figures)

1. Executive Summary (1pg)
2. Seismic instrumentation and its purpose (3-4pg)
 - 2.1. What is seismic instrumentation and how does it work
 - 2.1.1. Instruments record ground motion accelerations from earthquakes and a building's response to the shaking
 - 2.1.2. The two primary types of instrumentation – Force Balance and MEMS – differences in resolution, installation and procurement costs and maintenance
 - 2.2. How are instruments installed
 - 2.2.1. Selecting locations to capture the shaking of interest
 - 2.2.2. Avoiding ambient vibrations
 - 2.2.3. MEMS vs Force Balance installation
 - 2.2.4. Power and communications requirements
 - 2.3. Utilizing output from instruments for post earthquake recovery
 - 2.3.1. The raw data produced by instruments
 - 2.3.2. How data is processed to be usable by hospitals and their engineers
 - 2.3.3. Using instrumentation to estimate damage to hospital facilities – measuring ground shaking and comparing to building vulnerabilities; measuring floor accelerations in particular for damage to equipment; estimating torsion and interstory drift
 - 2.3.4. What do hospitals do with the data – triage, immediate decision making, where to send resources, inform engineering inspections
 - 2.4. Costs and maintenance
 - 2.4.1. Rough costs of the various sensor hardware
 - 2.4.2. Installation costs
 - 2.4.3. Ongoing maintenance requirements and costs
3. Setting up a hospital seismic instrumentation program (5-8pgs)

- 3.1. Establishing a comprehensive post earthquake response program that uses instrumentation data as information to inform decision making.
 - 3.1.1. Drawings, building data, contact information
 - 3.1.2. Setting up a plan beforehand Using a SaaS provider or creating your own platform
 - 3.1.3. Setting up alerts
 - 3.1.4. How information is disseminated
 - 3.1.5. Working with structural engineering consultants
 - 3.1.6. Regular scheduled meetings and training
- 3.2. Selecting instruments and budgeting
 - 3.2.1. Procurement and contracting – owning vs leasing, self managed vs SaaS
 - 3.2.2. CapEx vs OpEx budgeting
- 3.3. Selecting buildings to instrument
 - 3.3.1. Selecting based on vulnerability
 - 3.3.2. Selecting based on operational importance
 - 3.3.3. Power and communications requirements
- 3.4. Where to place instruments in a building
 - 3.4.1. Placement over the height of a building
 - 3.4.2. Placement over the footprint
 - 3.4.3. Avoiding ambient vibration
 - 3.4.4. Security
 - 3.4.5. Communications

4. Resources (1pg)