GLOSSARY

ACCELERATION – Rate of change of velocity with time, exerting a force on any mass or structure. When you step on the accelerator in the car or put on the brakes, the car goes faster or slower. When it is changing from one speed to another, it is accelerating (faster) or decelerating (slower). This change from one speed, or velocity, to another is called acceleration. During an earthquake when the ground is shaking, it also experiences acceleration. The peak acceleration is the largest acceleration recorded by a particular station during an earthquake

ACCELEROGRAM – A recording of the acceleration of the ground during an earthquake

AMPLIFICATION – A relative increase in ground motion between one type of soil and another or an increase in building response as a result of resonance

ATTENUATION – The rate with which ground motion shaking amplitude diminishes with distance for an earthquake with given magnitude. Ground motions attenuate more rapidly with distance in the western US, and more slowly in the central and eastern US.

DESIGN EARTHQUAKE – (In US recommended building codes) The earthquake that produces ground motions at the site under consideration that has a 98 percent probability of not being exceeded in 50 years (or a 2 percent probability of being exceeded)

EARTHQUAKE – A sudden motion or vibration in the earth caused by the abrupt release of energy in the earth's lithosphere

EPICENTER – A point on the earth's surface that is directly above the focus of an earthquake

EXCEEDANCE probability or probability of exceedance – The probability that specified level of ground motion or specified social or economic consequences of earthquakes will be exceeded at a site or in a region during a specified exposure time

"g" – the acceleration due to gravity or 32 feet per second per second

INTENSITY – The intensity is a number (written as a Roman numeral) describing the severity of an earthquake in terms of its effects on the earth's surface and on humans and their structures. Several scales exist, but the one most commonly used in the United States is the Modified Mercalli scale. There are many intensities for an earthquake, depending on where you are, unlike the magnitude, which is one number for each earthquake

MAGNITUDE – A number that characterizes the relative size of an earthquake. Magnitude is based on measurement of the maximum motion recorded by a seismograph. Several scales have been defined, but the most commonly used are (1) local magnitude (ML), commonly referred to as "Richter magnitude," (2) surface-wave magnitude (Ms), (3) body-wave magnitude (Mb), and (4) moment magnitude (Mw). This study uses the moment magnitude scale.

MOMENT MAGNITUDE (Mw) – A scale based on the concept of seismic moment, is uniformly applicable to all sizes of earthquakes but is more difficult to compute than the other types. All magnitude scales yield similar but not identical values for any given earthquake.

PERIOD – The period is the time interval required for one full cycle of a wave

RECURRENCE INTERVAL – The recurrence interval, or return period, is the average time span between large earthquakes at a particular site.

RICHTER SCALE – The Richter magnitude scale was developed in 1935 by Charles F. Richter of the California Institute of Technology as a mathematical device to compare the size of earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs. Adjustments are included for the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter Scale, magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 might be computed for a moderate earthquake, and a strong earthquake might be rated as magnitude 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

EARTHQUAKE HAZARD – Earthquake hazard is anything associated with an earthquake that may affect the normal activities of people. This includes surface faulting, ground shaking, landslides, liquefaction, tectonic deformation, tsunamis, and seiches.

EARTHQUAKE RISK – Earthquake risk is the probable building damage, and number of people that are expected to be hurt or killed if a likely earthquake on a particular fault occurs. Earthquake risk and earthquake hazard are occasionally incorrectly used interchangeably.

SEISMIC HAZARD ASSESSMENT – It exists fundamentally in two forms: Probabilistic and Deterministic Assessments:

DETERMINISTIC SEISMIC HAZARD ASSESSMENT – The quantitative specification of seismic hazards, most commonly expressed as a level of ground motion shaking at a given site, or for an entire region (in map form), for a given scenario earthquake, or a sequence of scenario events. One must specify the magnitude(s) and location(s) of the scenario earthquakes regardless of how likely their occurrence and time horizon is. Also, all the uncertainties are generally not considered rigorously.

PROBABILISTIC SEISMIC HAZARD ASSESSMENT – A rigorous method that quantitatively combines information and all of its uncertainties about seismicity (including the entire range of earthquake magnitudes and locations that can contribute to damage), ground motion attenuation, and site location for which the assessment is made. The result is most commonly expressed in terms of a probability of reaching or exceeding a given level of ground shaking per unit time. For example, the assessed peak ground acceleration at the evaluated site may be expected to be reached or exceeded with a 2% probability in a 50-year exposure time, implying a 98% probability in 50 years NOT to be exceeded. This is equivalent to saying that this level of ground motion can be expected or exceeded on average once every 2,475 years; or has an annual probability of 1/2,475 = 0.04% per year. If the evaluation is done for an entire region rather than for a single site, the result is usually displayed in form of a probabilistic seismic ground shaking hazard map.

SEISMICITY – Seismicity refers to the geographic and historical distribution of earthquakes and of their magnitudes.

SOIL PROFILE – The soil profile is the vertical arrangement of layers of soil down to the bedrock.

SOIL – Soil is (1) In engineering, all unconsolidated material above bedrock. (2) In soil science, naturally occurring layers of mineral and (or) organic constituents that differ from the underlying parent material in their physical, chemical, mineralogical, and morphological character because of pedogenic processes.

SOURCE – The source is the term for the released forces that generate acoustic or seismic waves, also called the earthquake source

VELOCITY – Velocity is how fast a point on the ground is shaking as a result of an earthquake.

VULNERABILITY – The degree of loss to a given element at risk, or set of such elements, resulting from an earthquake of a given intensity or magnitude; expressed in a scale ranging from no damage to total loss; a measure of the probability of damage to a structure or a number of structures