

Seismic calculations are used to calculate leg & saddle support strength for vessels during earthquakes.

Calculations are needed when:

- (1) Specification requires
- (2) Federal or State requirement
- (3) Project is going into a hospital, federal facility or heavy industrial facility.

**Quick Tanks can provide these calculations, including those required in California**



**1989 World Series Game 3  
Stopped for an Earthquake**



**1989 Loma Prieta Earthquake  
First 30 Seconds**

If seismic calcs are needed, fill out the attached “Seismic Date Request” (also on our website). The form asks for your site data, type of facility and strength/thickness of concrete.

**NOTE: these calculations SHOULD NOT BE REQUESTED AFTER THE FACT.**

Seismic calcs often increase the size of supports to accommodate earthquake forces. Rejection of a system already on site due to supports being inadequate will ruin your day.

The old “Zones 1, 2, 3 or 4” are no longer used. Your site’s physical address or zip code is entered into a USGS<sup>1</sup> database to determine the site-specific seismic data. The USGS site-specific seismic data, when mapped, looks like a topographic map of elevations with continuous lines separating the acceleration values. The analytical method from ASCE-7<sup>2</sup> is used as directed by IBC<sup>3</sup>-yr.

Data is available for the US & Canada, data from other nations is imprecise (You must require your customer to provide foreign country data that can be used in IBC).

Two fundamental areas are evaluated by seismic calcs:

- (1) Strength of legs (vertical tank) or saddles (horizontal tank)
- (2) Holding power: bolts embedded in concrete.

Additional evaluations include: stress on footpad (or baseplate), size of the footpad (do not want to over-stress concrete in compression) and shell stresses from supports.

If vessel(s) will be mounted to a frame (aka “skid”), seismic calcs include the frame.

**CALIFORNIA RULES FOR HOSPITALS & HEALTH CARE FACILITIES:**  
OSHDP<sup>4</sup> rules require special calcs and must be done by a California PE (SE)<sup>5</sup>

<sup>1</sup>USGS – US Geodetic Survey

<sup>2</sup>ASCE-7 – American Society of Civil Engineering, Minimum Design Loads for Buildings and Other Structures

<sup>3</sup>IBC – International Building Code

<sup>4</sup>OSHDP – Office of Statewide Health Planning and Development

<sup>5</sup>PE (SE) – California Professional Engineer, registered as a Structural Engineer