Soil liquefaction dangers during arthquake

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Ground shaking and shifting can cause major damage, tearing apart houses, buildings, and roads. •Flooding that arises from broken water dams or river levees is another hazard. •Tsunamis, triggered by an undersea earthquake as well as seiches – waves coming from lakes shaken by a temblor – can submerge whole communities, sweep away edifices, topple trees and drown people. •Fire is another seismic hazard. It can flare up from broken gas and power lines, or from overturned wood, coal, or gas stoves.

But there’s another major earthquake danger that not many are familiar with. Soil liquefaction is a phenomenon that occurs when soil mixes with groundwater during a moderate or strong earthquake, turning the ground into quicksand in minutes. Soil Liquefaction in Low-Elevation Areas Because the soil must be saturated for liquefaction to take place, it is more likely to occur in low-lying areas that are near bodies of water such as rivers, lakes, bays and oceans.

It happens most often in areas with sandy soil, where water takes hours to wend its way through the tiny channels of the mixture. More resistant to liquefaction are large-grained, permeable soils like gravel, which drains quickly, and clay soil, where particles are packed closely together.. It was in 1964, when earthquakes shook Niigata, Japan, and Anchorage, Alaska, that soil liquefaction was recognized as a major cause of earthquake damage. Scientists have since linked it to major historical earthquakes worldwide. Soil liquefaction inflicts great damage to property.

Since the ground is too unstable to withstand pressure, anything resting above the mush—a building, a bridge, a house, a pier, a runway, a nuclear

power plant, an earth dam—may lean, tip over, split open, or sink several feet. Ways to Reduce Soil Liquefaction Risks What can be done if a soil has been identified as susceptible to liquefaction? An undergraduate research paper written by Alisha Kaplan lists three ways to reduce liquefaction risks when constructing new buildings and structures. •Avoid building on liquefaction-susceptible soils.

Besides soil tests, vulnerable places can also be pinpointed by investigating past events in an area. Soils that had liquefied in previous seismic events can liquefy again if another quake occurs. •Erect liquefaction-proof structures. If construction on weak soil cannot be avoided, the structure’s foundation should be designed to resist the damaging effects of liquefaction. The building must be made ductile, equipped with adjustable supports, and constructed to withstand large deformations and p soft locations on the ground. •Improve the soil.

Improvements should increase ground strength, density and draining capacity. Installing vibroflotation, vertical wick drains, compact piles, and stone columns can lower the possibility of liquefaction. Soil liquefaction cannot be taken lightly, especially by those living in suspected liquefaction-prone areas. With earthquakes seemingly in the news more often, it serves residents and authorities alike to take a look around them and assess if they are standing on firm ground, literally. Taking safety measures in advance can save lives and property should a calamity strike.