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Occurrence of Soil Liquefaction Potential Assessed Over Time

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Abstract: Projects on soil, soil or soil can be made. Soil Liquefaction is a phenomenon due to the reduction of soil stiffness and strength Coming into force of an earthquake or if this is fast. Soil Liquefaction phenomena Associated with earthquakes in the past years a lot of damage around the world have entered. Liquefaction occurs only in saturated soils, water pressure between soil particles to Soil particles can enter. Soil liquefaction is a normal risk of land instability, soil erosion and Potential loss of agricultural land, soil can be generated. Three fine-grained soil (S) ground water level fluctuations (W) and horizontal earthquake acceleration (M) can cause soil liquefaction Structural change in the size and displacement of land or structures under the stress of this happening. If the soil is smooth and does not lose its shear strength, the rupture occurs. If the structures are built on or near these areas, damage.. There are several methods for improving the mental capabilities that can reduce the dislocation, soils under .

Keywords: Liquefaction, flow, stress, load, structure, meeting, mental, punctures

1 - Soil Liquefaction:

Liquefaction The soil reaction against dynamic loads or Stimulation-induced shear waves are transient. Soil Liquefaction is a phenomenon due to the reduction of soil stiffness and strength Coming into force of an earthquake or if this is fast. Soil Liquefaction phenomena Associated with earthquakes in the past years a lot of damage around the world have entered. Liquefaction occurs only in saturated soils, water pressure between soil particles to Soil particles can enter. The pressure causes the soil particles are pressed firmly together. Before the earthquake the water pressure is relatively low. But with the increased water pressure and earthquake tremors Soil particles begin to move together so quickly. Although most of the ground shaking The increase in pore pressure. But the explosion of construction related activities or Water reservoirs and total change in elastic stress field and the lifting of this Can also be caused by soil liquefaction.

If a saturated sand The vibration becomes, and the volume of compacted material is reduced. In such circumstances, if the water Sand can be removed quickly from the environment, reducing the volume of pore pressure is increased and Sand completely loses its shear strength. The state found liquescence That the grain size of sand and sand with layers of sediments for the most vulnerable Are liquefaction, especially if you have poor granulation. The permeability The material and the drainage is slow. If a saturated sand deposits under vibration Be willing to reduce the size and density can be found. In this case, if the drainage If established, the result will be a pressure chamber. If the vibration Discontinuous, pour water pressure increases in deposits of sand, Occasionally it may Is equal to pressure overload. In such cases the effective stress becomes zero and no soil Shear strength of will. Liquefaction is known to such cases, therefore, the threshold Liquefaction is the effective stress on the soil is zero. The methods To determine the effect of different threshold potentials liquescence soil behind the walls of mental Can cause the destruction of the retaining wall. The increase in pore pressure Dams can also be caused by landslide and liquefaction of soil in many of the dams break Earthquakes are observed. Liquefaction of soil as a natural risk of causing instability, soil erosion and Potential loss of agricultural land, soil can be generated. Three fine-grained soil (S) ground water level fluctuations (W) and horizontal earthquake acceleration (M) can cause soil liquefaction Be.

The best wind potential in the liquefaction of sand and clay of the soil More sand, liquefaction potential is low.

A. Integrity of the building foundation and structure of the building resistance against the adverse effects of elevated Liquefaction is from.

B. In areas where the probability of liquefaction (liquescence) There is extensive use of the following is required.

C. In areas with potential Liquefaction, wooden building is appropriate.

D. Liquefaction is completed when the Resistance is close to zero.

E. Liquefaction potential with the value of the standard Is measured.

F. Liquefaction Phenomena (liquescence) in the soils of the cutting They are low in volume occurs.

G. Potential to improve soil Liquefaction and soil consolidation method is appropriate.

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H. In soils with Liquefaction potential wave velocity is about 250 meters per second.
I. In Liquefaction during earthquakes, followed by fluctuations in water pressure increases.
J. To prevent the phenomenon Soil liquefaction, which has the talent, the construction should take into liquefaction layer With specific methods or practices to which the dense layer can be refused.

2 - flow liquefaction:

Because the liquefaction phenomenon usually occurs only in saturated soils in areas near water such as rivers, lakes, bay and the ocean has more harmful effects. The effects of this phenomenon in areas close to the coast and into the water and slip the soil or move it to the ground and create additional stress of being left on the beach. Damage to ports and dock walls, creating pressure to hold back soil and water, pushing it towards the other injuries that can cause liquefaction in areas near the coast. Liquefaction flow (flow liquefaction) is a phenomenon in which the sedimentary soils of static equilibrium with the residual resistance due to static or dynamic loads eats together. Residual soil strength is mental strength. Static load of the new building is built on the slope of the coming into force of additional soil under the foundation. Earthquakes, explosions, and dynamic loads are piling out.That can be caused to flow liquefaction. A phenomenon that also occurred in soil liquefaction during soil liquefaction is likely to occur. Such as soil strength sufficient to withstand the stress of the unrest is not static. Static stability of a skier with his pushing forward the starting point obtains. After a little unrest in the static driving force of the weight (gravity force component along the horizon) is greater than the force of friction between ski and snow. And accelerated by the skier down the slope. Similarly, an unstable situation caused by static or dynamic force distribution and movement of soil is caused by acceleration. This phenomenon is the rapid movement of large masses of soil characteristics.

3 - cyclic mobility:

In effect, this phenomenon repeated in sedimentary soils with soil resistance of static shear stresses occur. Deformation of periodic mental stress due to the increase in static and dynamic earthquake spread. Mental results of periodic broadcast side (Lateral spreading) of soil on lower slopes and flat areas along the rivers and seas. In a flat terrain due to high pore pressure caused by liquefaction phenomenon caused by rapid water flow in the Earth's surface. During this time, during and after an earthquake occurs. If the pore size and enough speed to hold the sand particles to move toward the Turks and the sand is boiling phenomena. this phenomenon more in the areas under phenomenon of liquefaction were to occur. Following the pattern of gradual change due to stress that affect the earth dam during construction of the dam, the standard penetration test number from which to assess the liquefaction potential is used, and changed gradually increases. After the dam is built using the standard penetration test, the calculations necessary to evaluate the potential for liquefaction to be repeated again.

4 - Stress analysis of this structure:

Speculation is the minimum range that the added stress of this structure in the desired depth of less than 10 percent of its value in less than 5 per cent level or depth of the effective stress (the stress is less) reach. Measure of stress in the depth range of 10% within 2 to 4 times followed by a square bar takes you to discover. Following the occupation of individual levels can finally be on all plans. In the wake of tensions following the expansion of individual bubbles in the wake of tensions in the depth below the surface with a standard 5 percent of the effective stress and stress due to the overlap and interfere with the individual seeking the equivalent stress range of bubble The wide range of stress below the surface was assumed. Assuming the stress distribution under the plan 2 to 1 in the building, resulting in overlap and equivalent stress levels all followed with a single broad surface of B * L, the minimum depth of borehole (H) calculated using the relationship are:

$$0.05\gamma H = q_{avg.} BL / (B + H)(L + H) \quad (1)$$

Where B and L, respectively, width and length of the ground infrastructure in the plan, q_{avg} classes total pressure, H the depth of at least 5% based on the criteria for an effective tension is equal to the depth of tension in the topside. Assuming $0.05\gamma = x$, then $H / B = m$, $L / B = n$, we have:

$$X^3 + (n+1)x^2 + nx - n(q_{avg} / B) * 1 / x = 0 \quad (2)$$

Assuming the specific gravity values and taking into account the stresses acting on the bed, followed by q_{avg} weight classes, both live and dead, and consider the following aspects can be for a minimum depth of

exploratory boreholes to obtain. Determine the minimum depth of the borehole (H) can be wide ranging exploration of (the plan) can be determined using the following relations:

$$L^{'/} L = 1 + (H / L) \quad (3)$$

$$B^{'/} B = 1 + (H / B) \quad (4)$$

H above the minimum depth exploration of the relation L 'long range reconnaissance and B' is built around a wide range of detection. If high water levels have submerged specific weight γ in the calculations and identify the depth increases. With B and L (width and length of the building plan), the values of H (depth of detection) B', L' width and length will determine the scope of identification. Reduction in the depth of the above criteria to identify when the dense soil or bedrock encountered. Can be revised. Furthermore, if the bed of clay and consolidated ordinary meetings may be necessary to dig deeper and examine more than 5 percent to 10 percent effective stress and tension resulting from this practice is the criterion.

5 – Meeting the shippers:

Often the structural changes in the size and displacement of land or structures under the stress of this happening. A change in the elastic and plastic deformation in the soil, seeds, soil, thereby changing the volume of air displacement of pore water and cut the overall mass of soil particles and can be created. Load, and geometry of the soil profile in the wake of the meeting was effective, and therefore the cargo is, and estimate the interaction meeting. And can not pay them separately. Meeting of the factors affecting the incidence of soil compaction and displacement of elastic loading, the strengthening of the load and pore pressure and subsequent drainage of water out of the pores in fine-grained soils and saturation, changing the materials used in The activities in construction and environmental factors such as cross border traffic, explosion, contraction of the soil, water Shstgy, soft soil, rock and condensation under the name of environmental factors. Based on elasticity theory, following a meeting of a rectangle or a circle under a uniform elastic half-space is obtained from the following:

$$S = KqB \quad (5)$$

The contact pressure q, B width or diameter of P. The circle and k is a constant of proportionality. The K coefficient is a function of the Cross, the depth, length to width ratio, Poisson ratio and the pressure is on. Using equation (5) to compare two successive meetings on the same soil, and therefore can be identical K

$$S_i / S_{ref} = q_i B_i / q_{ref} B_{ref} \quad (5)$$

6 - The failure of the mental dislocation, and its effects on structures:

If the soil is smooth and does not lose its shear strength, the rupture occurs. If the structures are built on or near these areas, suffers. Punctures smooth rupture of the earth are divided into 3 categories b - the B side - the current failure - loss of bearing capacity . Lateral movement of surface soil layers parallel to the ground. Psychological phenomenon that occurs when the dislocation, the shear strength of the surface layer to disappear. Very gentle slope on the side with less than 5% occurs. If there is differential expansion on a structure, tensile strength sufficient to destroy the whole structure will come into existence. building more flexible handling of the fragile structure of the growing resistance. Equipment side of the long buried in the soil (the critical lines) has a great effect. Tear flow that occurs when large areas of soil are mental or not mental block on a layer of clay soils to flow smoothly by. Slip flow occurs where the slope is less than 5 percent. Punctures can cause mental lead to loss of bearing capacity. This rupture usually occur when the stream. Where large areas of clay soils, mental or psychological blocks to a layer of soil on the smooth flow. Slip stream, in places with slopes of less than 5% occurs. The rupture caused by direct or indirect effect on the mental dislocation structures depend on the extent of psychological dislocation. If flowing thick and wide punctures in horizontal layers of sand occur, its effects on the structure is very high. But if it punctures its mental The layers of the soil crust is thin and the other, then the structure will undergo minor injuries.

7 - The mental dislocation, loss of soil:

There are several methods for improving the mental ability of the punctures can reduce the area under the soil. (1)

Table 1: Methods of psychological dislocation, loss of soil through land reform

Method	How to reform
Soil sampling and soil instead of flowing prone to punctures	A - Excavation and compaction of the soil engineering (to increase soil density and decreasing the flow of soil) B - Excavation and compaction of soils engineering have been modified with additives C - removal of existing soil and replace it with a smooth rigid soils that are compacted properly
Quench residual soil	A - pile of compression B - Mill boreholes vibration F - floating vibration (loose soil density) D - Planning slurry compression - The dynamic compaction or condensation of impact
They improve the soil in situ with	A - in-situ soil mixing with additives (to provide resistance to shear) B - Removal of residual soil with geysers and replace them with smooth rigid soil (density increase flexibility and strength)
Planning slurry or chemical fixation	Injection of particulate materials, resins, chemicals, into the hole, soil shear strength increases

Conclusion:

The best wind potential in the liquefaction of sand and clay of the soil More sand, liquefaction potential is low. Because liquefaction occurs only in saturated soils in these areas often near water such as rivers, lakes, bay and the ocean has more harmful effects. Deformation of periodic mental stress due to the increase in static and dynamic earthquake spread. Pore pressure due to the flat land above the liquefaction phenomenon caused by rapid water flow is at ground level. This is the time during and after an earthquake occurs. If the pore size and fast enough come up through the sand particles into the cracks and sand are on the boiling phenomena. . In the wake of tensions following the expansion of individual bubbles in the wake of tensions in the depth below the surface with a standard 5 percent of the effective stress and stress due to the overlap and interfere with the individual seeking the equivalent stress range of bubble The wide range of stress below the surface was assumed. Very gentle slope on the side with less than 5% occurs. If there is differential expansion on a structure, tensile strength sufficient to destroy the whole structure will come into existence.

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