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EDITORIAL

SITE CONDITIONS IN AN EARTHQUAKE.

MEXICO CITY SITUATION

The impact generated in society by the consequences derived from a seismic event is directly associated with the evidence of material and human losses in the populations. The magnitude of these losses is equally related to the conjunction of factors such as seismicity, construction materials, soil deposits, geometry of the buildings, design regulations. While there is a study and understanding of physical phenomena linked to a seismic event in general, such as wave propagation in various media, dynamic response of building materials and soil deposits; there are typical aspects of each area that can magnify the impact that an earthquake has on a population.

Internationally, Mexico City is renowned for the peculiarity of its geotechnical conditions, which emanate from the emergence of a city in the middle of a lake, as evidenced by various artistic reproductions of the great city of Tenochtitlan, currently Mexico City. This situation that today represents the presence of soft clay deposits with atypical water contents, of the order of 250%, adds to the great territorial extension that the city has, approximately 1485 km2, which entails a geotechnical characterization constituted by three zones: Zone I or Lomas, Zone II or Transition and Zone III or Lake. Zone I or Lomas mainly concerns firm rock formations; deposited outside the lacustrine environment; Zone III or Lake is due to highly compressible clay deposits, separated by sandy layers.

Zone II or of Transition corresponds to the intersection between zone I and III, where it is possible to find intercalations of sandy and silty strata with lake clay layers, in depths of up to 20 m. On the other hand, the large amount of water in the subsoil makes aquifers the main source of water supply for approximately 8.9 million inhabitants. Its extraction process not only accelerates the consolidation of clay deposits, it has also led to the appearance of cracks in different areas of the city, especially in Transition zones.

On September 19, 2017, the Mexican National Seismological Service reported an intraplate earthquake with a magnitude of 7.1, whose epicenter was located approximately 120 kilometers from Mexico City, between the states of Puebla and Morelos. Several technical reports present accelerographic records with ground

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accelerations ranging from 63 to 226 Welsh (1 gal = 1 cm / s2), depending on the type of subsoil in which the record was acquired; being of greater acceleration those corresponding to the Lake area, and those of less acceleration to the Lomas area.

As a result of the earthquake on September 19, various damages were reported, ranging from the appearance of fissures to the collapse of structures. In particular, a large number of them were located in the Transition zone and corresponded to constructions between 4 and 7 floors, which evidences the marked of the site effect that occurred in the zone, where probably the amplification of seismic waves through the thickness of the clay deposit (maximum 20 m) achieved a correspondence with the frequency of vibration of the structures with average height. There were also large fissures in the subsoil, which corresponded to the expansion or appearance of cracks in transition zones, where there is more evidence of them due to the water extraction phenomenon of the aquifers, demonstrating once again the site effects before an earthquake.

Undoubtedly, the described geotechnical environment is added to the aspects of normativity, design of structures and construction processes that are applied in Mexico City, which result in the response of structures to seismic events of various magnitudes. Therefore, it is important to strengthen collaborative work that allows various professionals to gather information from various perspectives, in order to provide better explanations of the events and thus provide security measures according to each region.

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