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Original Article

A STUDY ON LIQUEFACTION SUSCEPTIBILITY OF FINE GRAINED SOIL IN JABALPUR CITY

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ABSTRACT

Liquefaction is the transformation of granular material from solid state in liquefied state, with a significant increase in pore water pressure until effective stress reaches to zero. This causes damage in the form of landslides and foundation failure. Soil liquefaction has drawn the attention of the world, after two mighty earthquakes of Alaska & Niigata in the year 1964. Initially, research on liquefaction was based on uniform clean sand, containing little or no fines, but many past earthquakes occurred in the areas containing 20% to 90% fines, this had broken the earlier myth. Thus, the role of fineness emerged as an important aspect, in liquefaction susceptibility and is being studied by researchers all around. But, the criterions developed by them are complex, time consuming and need expertise. So, here in this study an attempt has been made, to develop a simplified approach to study this phenomenon through Index properties.

Jabalpur is a fast developing city and multistory buildings are also emerging in the city now. On the other side, cases of liquefaction were also reported in the city during the earthquake of 22nd May, 1997. So, the knowledge about liquefaction susceptibility of the city, is the need of the time. In view of these facts, this study is undertaken in Jabalpur city.

This study is conducted in the City of Jabalpur, Madhya Pradesh, India (23^{0}09'57.8"N & 079^{0}57'05.5"), which is expanding rapidly in all directions. Looking to this fact, twenty locations are selected randomly for taking samples of soil.

Sampling is done at two different depths at each location. The collected samples are tested in the Geotechnical Engineering laboratory of Jabalpur Engineering College for Liquid limit, Plastic limit, NMC, DFS, Sieve analysis, as per the relevant IS a code of practice.

Liquefaction susceptibility of soils of the study area is ascertained, on the basis of criteria suggested by Andrews& Martin (2000), popularly known as the Modified Chinese criteria

Liquefaction is an amazing phenomena and also a complex one, and its susceptibility cannot be predicted /analyzed just by one criteria, only. So, to verify and ascertain this, the same obtained results are then put up in another criteria, developed by Seed et al. (2003) known as: -Recommendations assessment of liquefiable soil types.

The results obtained from both the criteria's are compared with one another, and on the basis of this comparison a final conclusion has been drawn.

KEYWORDS: Liquefaction is an amazing phenomena, -Recommendations assessment of liquefiable soil types & Sampling is done at two different depths at each location

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