

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JNANA SANGAMA", MACHHE, BELAGAVI – 590018, KARNATAKA



2022-2023

Project Report on

**“EFFECT OF PERMEABILITY OF SOIL ON
LIQUEFACTION FAILURE OF STRUCTURE – AN
EXPERIMENTAL STUDY.”**

Submitted in partial fulfillment of the requirement for the award of degree

**BACHELOR OF ENGINEERING
IN
CIVIL ENGINEERING**

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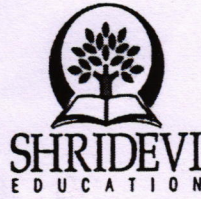
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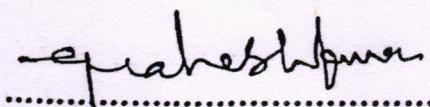
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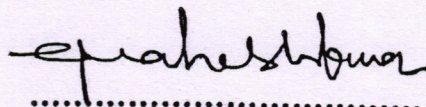
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CERTIFICATE

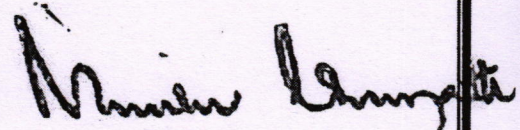
Certified that a project report on entitled “EFFECT OF PERMEABILITY OF SOIL ON LIQUEFACTION FAILURE OF STRUCTURE – AN EXPERIMENTAL STUDY” has been successfully carried out by SHIVAMURTHY S V (1SV18CV031), DARSHAN K V (1SV18CV010), AMRUTA VARSHINI P (1SV18CV002), NAYANA D T (1SV18CV009), students of Shridevi Institute of Engineering and Technology, Tumakuru -572106, in partial fulfillment of project for the award of Bachelor of Engineering in Civil Engineering of the Visvesvaraya Technological University, Jnana Sangama, Belagavi -590018 during the academic year 2022-2023. It is certified that all corrections and suggestions indicated for internal assessment have been incorporated in the report deposited in the Department library. The report has been approved as it satisfies the academic requirement in respect of project on current topic prescribed for B.E Degree.



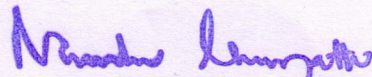
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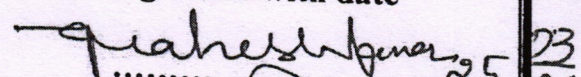

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ABSTRACT

The soil permeability coefficient plays a key role in the process of the liquefaction Phenomenon. Liquefaction causes a considerable increase in soil permeability, due to the Creation of easier paths for water flow. The work presented in this paper tries to investigate the Effects of permeability on liquefaction phenomenon by conducting experimental modelling. Sieve test, Liquid limit test, and plastic limit test and also permeability tests will be conducted on sandy soil without fines, sandy soil with various percentage of clay fines such as 10%, 20%, 30%, 40%, 50%. Also experimental model study carried out on sandy soil without Fines and sandy soil with various percentage of clay fines.

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CHAPTER 4

4.1 MATERIALS & METHODOLOGY

4.1.1 GRAIN SIZE ANALYSIS TEST:

Size distribution. Size distribution is perhaps the single most important aggregate quality associated with the control of HMA mixtures. Aggregate gradation and size affect HMA volumetric properties as well as mixture permeability and workability.

In a gradation and size analysis, a sample of dry aggregate of known weight is separated through a series of sieves with progressively smaller openings. Once separated, the weight of particles retained on each sieve is measured (Figure 2) and compared to the total sample weight. Particle size distribution is then expressed as a percent.

Retained by weight on each sieve size. Results are usually expressed in tabular or graphical format. Graphical displays almost always use the standard. We are going to taking the reference of IS 2720-17(1986), by bureau of Indian standards.

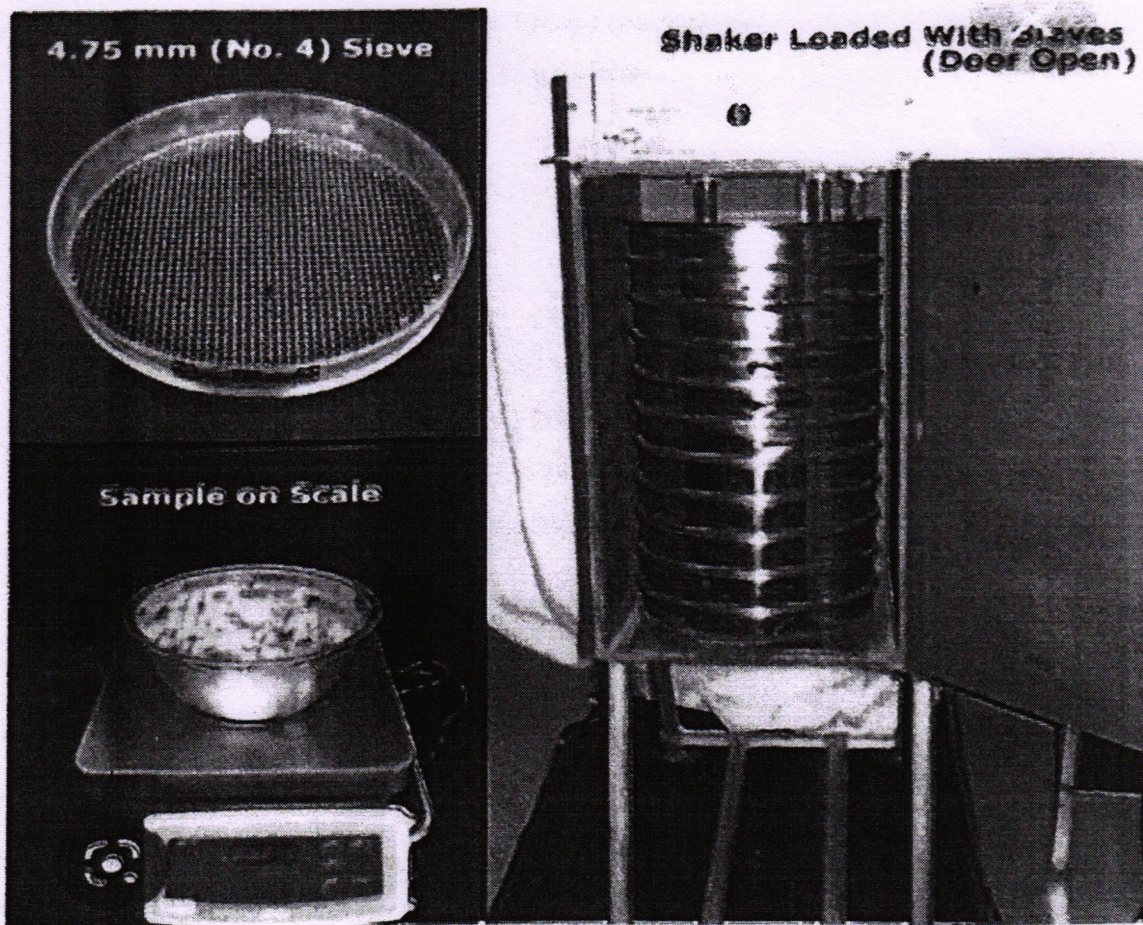


Fig 4.1.1 GRAIN SIZE ANALYSIS OPERATORS

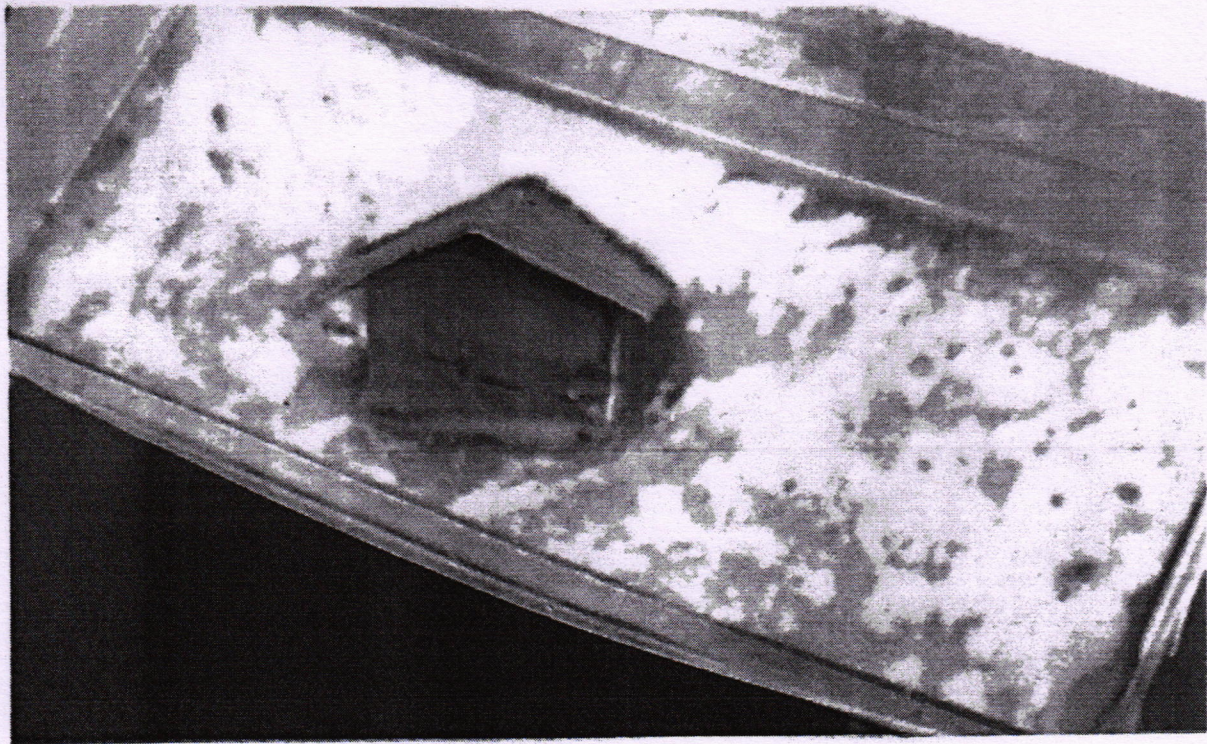


Fig 5.2 HOUSE SINKING INTO THE SAND

Place a cardboard house onto the sand. For additional weight, place rocks within the house.

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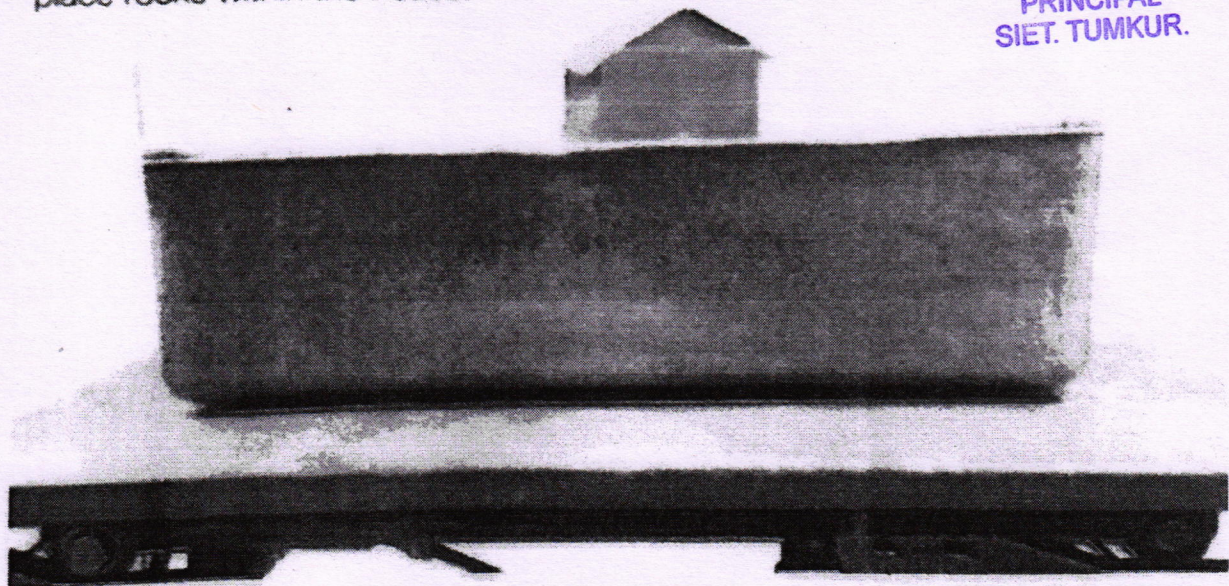


Fig 5.3 CARDBOARD HOUSE ONTO THE SAND



Fig 5.1.1 Grain Size Analysis Test

Apparatus:

- 1) Weighing balance
- 1) I.S sieves
- 2) Mechanical sieve shaker

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Procedure:

- 1) For soil sample of soil retained on 75 micron I.S sieve.
- 2) I.S sieves are selected and arranged in the order.
- 3) 1000gms of 0% fines dry sand is being taken for test.
- 4) After sieving. Recorded the data. And drawn the graph for 0% fines.



Fig. 6.1 LIQUEFACTION OCCURS AT 0% OF FINES



Fig. 6.1 STRUCTURES WILL BE STABLE AFTER ADDING 10% FINES

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