UTM
UNIVERSITI TEKNOLOGI MALAYSIA

RESEARCH UNIVERSITY

CIVIL ENGINEERING LABORATORY

CONCRETE LABORATORY

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TOTAL MEMBERS:	
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DECLARATION
I/We declare that this laboratory report is my/our own work and does not involve plagiarism or unauthorized collusion. Signature(s): _____ Date: _____

Assessment *(please see overleaf for assessment rubrics)*

Scores :

C3 - NORMAL CONSISTENCY OF CEMENT PASTE

INTRODUCTION

The manufacture of cement requires stringent control and a number of test are performed to ensure the cement is of the desired quality. One of the tests of the properties is the setting time. This test is done on a neat cement paste of a standard consistency. A standard consistency is the water content of the paste that will produce the desired consistency of any given cement. The water content of the standard paste is expressed as a percentage by mass of the dry cement, the usual range of values being between 26 and 33 percent. A cement paste is said to have a standard consistency when a plunger of the Vicat's apparatus penetrates the paste to a point 6 $\pm$ 1mm from the base of the mould.

OBJECTIVE

To determine the water content to produce standard consistency of cement paste

APPARATUS

1) Balance
2) 200ml glass graduated measuring cylinder
3) Vicat Apparatus (see Figure C3-1)

PROCEDURE

1) Take about 500 g of dry cement
2) Add 100 g of water to the cement (say 20% by weight of cement)
3) Thoroughly mix the cement and water to produce a ball-like shape by tossing from one hand to another

4) Place the spherical mass in the cylindrical mould and shake it forward and backward until the paste has filled up the mould. Slice off the excess paste at the top of the mould by single oblique stroke of a sharp edged trowel and smooth the top, if necessary with a few light touches of the pointed end trowel. During this operation of cutting and smoothing, take care not to compress the paste.
5) Place the mould on the base of the Vicat's Apparatus, in such a way the plunger is above the center of the mould.
6) The above sequence should be completed within 2 minutes from the moment the water was added. Bring the plunger in contact with the surface of the cement paste and release it.
7) Record the reading of the scale of the Vicat's Apparatus 30 second after the plunger being released.
8) Repeat the entire procedure four to five times, each using new dry cement and increasing amount of water.
9) Plot the graph the percentage of water against the distance from the base.

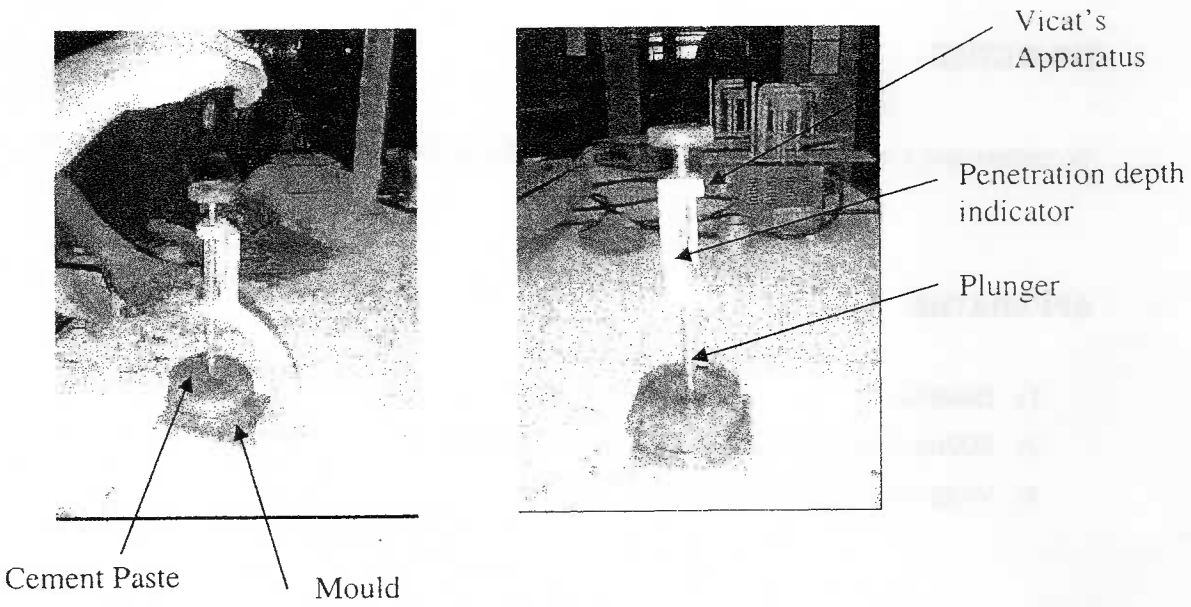

Figure C3-1: Vicat Apparatus

Result

The time from the moment of adding the water to the cement = _____

The time for the plunger end C to reach 5 mm penetration from the mould bottom = ____

Time for the plunger F fail to provide mark on the cement paste = _____

Initial setting time = _____

Final setting time = _____

Questions:

1) What is the standard time for initial setting time and final setting time according to MS 522: 1989. Does your cement paste fulfill the standard?
2) Give the current temperature and relative moisture of the lab where you are conducting your test and the standard values according to MS 522: 1989. If there are differences, how you overcome the problem and what is the influences to your result?
3) For practicality in construction site, what is the solution if the setting time obtained do not meet the MS 522 standard?

DATA

Number of test	Volume of water (ml)	Percentage of water/cement content (%)	Penetration (mm)	Note

RESULT

1. Water content for 5 mm penetration = _____
2. Water content for 7 mm penetration = _____
3. Water content for standard cement consistency = _____

Question

1) Why the cement paste becomes warm when water was added?