

**MATERIAL & STRUCTURE LABORATORY**

**FACULTY OF CIVIL ENGINEERING TECHNOLOGY**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**CON-01: DETERMINATION CONSISTENCY OF STANDARD CEMENT PASTE (VICAT TEST)**

**OBJECTIVE**

To determine the requirement of water content to produce the standard consistency of cement.

**APPARATUS**

1. Vicat apparatus
2. Balance
3. Ordinary Portland cement
4. Glass plate
5. Spoon,
6. 250 ml cylinder measurer

**PROCEDURES**

1. Prepare 500 gm of cement and place it on a glass plate.
2. Make a hole at the centre of cement by using a spoon and pour 130 ml of   
   tap water inside the hole.
3. Then, fill up the hole within 30 second and leave the cement powder for 30   
   second to absorb the water.
4. After that, mix the cement and water uniformly for approximately 1 ½ minute   
   before moulding the cement paste into shape of ball. With gloved hand, toss   
   the ball six times between two hands with 150 mm of distance.
5. Place the ball inside the Vicat apparatus ring on to the glass plate.
6. Shake the ring slowly until the mould full and cut the surplus of the paste with a flat sharp cutter until the surface of sample is flat. Avoid pressing the   
   cement paste into the mould.
7. Place the ring containing the cement paste under the Vicat needle. Make sure   
   the needle can move smoothly down. Touch the end of needle on the surface   
   and release it. With under the self weight, the needle will penetrate the   
   sample. The penetration depth depends on the consistency of cement paste.   
   Record the reading after 30 second.
8. Repeat the test 4 times with trial paste containing various percentages of   
   water.

**DISCUSSION**

* 1. Using the data in Table 1, plot the graph of water / cement (%) versus depth of penetration (mm).
  2. With finer particle cement size, would more or less water be required to achieve the normal consistency? Briefly explain.
  3. How would the reading be if it the recording of the depth of penetration is taken after 30 minutes? Briefly explain.

**CONCLUSION**

**RESULT**

|  |  |  |  |
| --- | --- | --- | --- |
| **No. of Experiment** | **Water Content (ml)** | **Water / Cement (%)** | **Depth of Penetration (mm)** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |