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DEPARTMENT OF CIVIL ENGINEERING  
MATERIALS OF CONSTRUCTION LABORATORY  
CIVL 484 REPAIR & MAINTENANCE OF CONCRETE  
GAZIMAGUSA

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Experiment No : #5

Name of the Experiment : rapid chloride permeability test for concrete

ASHTO CODE : ASHTOT277

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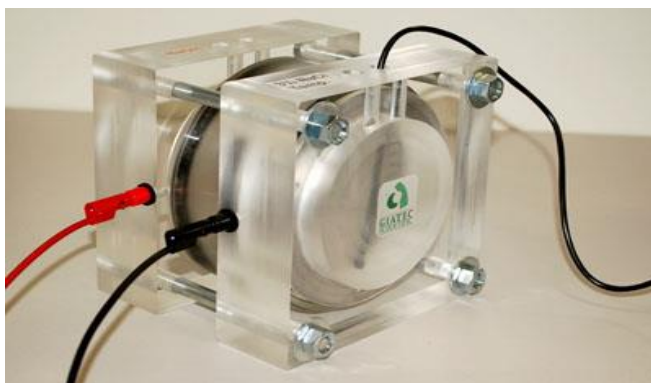
# Rapid chloride permeability test for concrete

## I. Object and Scope

this research is originally developed by Portland cement association under the research program paid by Federal highway administration (FHWA).many of concrete build today under low permeability structure and this test designed to evaluate chloride permeability of concrete. As other experiments it is also nondestructive experiment. Previously this test has been done by the name of PONDING TEST like in ASHTO T-25980 (RESISTANCE OF CONCRETE TO CHLIRIDE ION PENETRATION) since it was taking 90 days due to slow migration of chloride in concrete as well as the necessity to take sample of concrete at various depth to determine chloride profile hence this test was developed accelerate the process of migration using electrical current. The test also will make the result comparison possible between rapid chloride permeability test and Ponding test.

## II. Apparatus

a concrete specimen ,NaCl liquid , NaOH liquid , rapid chloride permeability test device, test cell



### III. Test Procedure

**the test method is consist of monitoring the amount of electrical current passed through the specimen during 6 hours period.**

1. cut the concrete cylinder by 51 mm thick and 102 mm nominal diameter and make the sample ready
2. open the test cell and put the specimen inside
3. fill 3% by mass in one side of test cell with sodium chloride solution (NaCl) in distilled water and on the other side of cell tank fill 0.3 N of sodium hydroxide (NaOH) in distilled water.
4. connect the cable to the rapid chloride permeability test device and from the other side to test cell
5. run the rapid chloride permeability test device with 60 Voltage and let it complete the procedure for around 6 hours
6. once the device completed the task the result will be display on the device monitor in terms of permeability class(reading has to be taken every 30 minutes for comparison purpose).
7. by deriving the amount of charge passed through specimen according to the table below we can specify the chloride ion penetrability

<b>Charge passed (C)</b>	<b>Chloride ion penetrability</b>
> 4000	High
2000 – 4000	Moderate
1000 – 2000	Low
100 – 1000	Very low
< 100	Negligible

**precautions : using NaOH could cause very severe burns and injury to unprotected skin and eyes. And suitable personal protective such as : full face shield , rubber aprons and and gloves impervious to NaOH is necessary while performing this experiment.**

**note** : the existing the rapid chloride permeability test device in the lab is monitoring the heat and the current at same time automatically while using different device on the same experiment you might need to control the temperature which is caused by current passing through the specimen.