SECTION 6

SAMPLING AND TESTING

CEMENT AND CONCRETE

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TEST METHOD	REVISED DATE	SECTION 6 - SAMPLING & TESTING CEMENT AND CONCRETE
NTTM 601.1	06 / 03	Quality Control of Concrete - Wet Analysis

TEST METHOD : NTTM 601.1
REVISED DATE : 06/03

QUALITY CONTROL OF CONCRETE - WET ANALYSIS

1. SCOPE

This test method is for determining the moisture content and sieve analysis of freshly mixed concrete. It may be used to give an indication of the cement content of freshly mixed concrete provided the sieve analyses of all the concrete components and that of the cement used are known.

Normally the test will be carried out in two stages, the first being at the point of discharge of the concrete and the second in the laboratory.

2. APPARATUS AND PROCEDURE

STAGE 1 (POINT OF DISCHARGE)
A sample of concrete of about 25 kg shall be obtained from the freshly mixed concrete in accordance with the procedures outlined in AS 1012.1. The sample shall be thoroughly mixed and a 10kg portion (approx.) shall be placed in a previously weighed tray and weighed immediately. The mass of tray and wet sample shall be recorded. The sample should then be protected as necessary for transporting to the laboratory for the determination of moisture content.

A second portion of approximately 10kg mass shall be placed in a weighed dish and the mass recorded. Water shall then be added to the dish and the concrete thoroughly mixed, allowed to stand for 15-20 seconds and the water and cement poured off through a 75 /um AS Sieve. This process of elutriation shall be repeated at least twice. The portion retained on 75/um sieve should be added to the sample.The sample should then be protected as necessary for transporting back to the laboratory.

STAGE 2 (IN LABORATORY)
The moisture content sample shall be dried out as quickly as possible over a gas ring or similar heat source. The sample shall be considered to be fully dried out when two successive weighings, at least 30 minutes apart, are the same. Record the dry mass of the sample, plus tray.

The second portion shall be further elutriated until the wash is clear. The 75 um Sieve residue shall be washed back into the dish and the dish and its contents dried out in an oven at 105°C - 110°C until drying is complete.

When the sample is dry, a mechanical analysis shall be carried out in accordance with AS1141.11. Also the ratio of the moisture content to the material passing the 75 um Sieve shall be reported, as shall be the slump of the concrete sample.

3. COMMENTS ON APPLICATION OF TEST

1. Good reproducibility in the grading of freshly mixed concrete can be obtained by this procedure for the analysis of wet concrete. For correct interpretation of the results however, especially percentage passing the 75 um Sieve, the grading of the aggregates and cement used must be known.

2. Experience has indicated that four hours directly over a gas burner is required to determine the moisture content accurately, and also that the correct moisture content can only be determined if the interval between initial mixing and commencement of drying does not exceed one hour.

3. The benefits of using Wet analysis as an auxiliary to the usual quality control in the field are as follows:-

   - The analysis will indicate serious departures from the specified grading, particularly when dealing with concrete batch plants that have small stockpile reserves which prevent pre-testing.
   - The analysis will indicate immediately any appreciable weighing fault in the batching system.
   - Perhaps the most important aspect is the constant check on the water content, which will indicate if the assessment of the aggregate moisture contents is correct and also provides a check on the water gauge.