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**DIVISION OF ENGINEERING SERVICES**  
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## METHODS FOR THE CHEMICAL ANALYSIS OF WATER

### A. SCOPE

Submitted water samples are analyzed either partially or completely, depending upon the intended use.

Water to be used in portland cement concrete is usually analyzed only for total solids and pH. If the total solids are excessive (above 2000 ppm) or if the pH is decidedly acid or alkaline, an analysis for chlorides and sulfates should be made. The purpose of this is to determine if the sample contains deleterious dissolved materials, which would adversely affect the properties of the concrete.

Sometimes water samples are submitted for a complete anion and cation analysis. The following methods include the complete scheme for the systematic analysis of water in addition to the methods detailed for the analysis of water used in portland cement concrete.

Determine the following properties and constituents of water using the procedures that are specified in the accompanying references.

### B. REFERENCES

ASTM Designation: D 1976  
"Standard Methods for the Examination of Water and Wastewater"

### C. REAGENTS

Unless otherwise indicated, all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.

### D. TOTAL SOLIDS

Refer to Standard Methods for the Examination of Water and Wastewater, Total Solids Method 2540B; except dry using an oven at 110°C. Report results to the nearest 10 ppm if the dry residue is over 100 mg and to the nearest 1 ppm for residue less than 100 mg.

### E. SODIUM, POTASSIUM, IRON AND MANGANESE

Determine in accordance with ASTM Designation: D 1976, Inductively Coupled Argon Plasma Atomic Emission Spectroscopy. Alternatively, Method 3120B of the Standard Methods for the Examination of Water and Wastewater may also be used.

### F. MISCELLANEOUS DETERMINATIONS

Refer to the appropriate method of analysis in ASTM Standards or Standard Methods for the Examination of Water and Wastewater.

**G. HEALTH AND SAFETY**

It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Prior to handling, testing or disposing of any materials, testers must be knowledgeable about safe laboratory practices, hazards and exposure, chemical procurement and storage, and personal protective apparel and equipment.

Caltrans Laboratory Safety Manual is available at:

[http://www.dot.ca.gov/hq/esc/ctms/pdf/lab\\_safety\\_manual.pdf](http://www.dot.ca.gov/hq/esc/ctms/pdf/lab_safety_manual.pdf)

Users of this method do so at their own risk.

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**(California Test 405 contains 2 pages)**