



MATERIAL SPECIFICATION FOR WATER

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1302.01 SCOPE

This specification covers the requirements for water used in the mixing and curing of concrete and mortar.

1302.01.01 Specification Significance and Use

This specification is written as a municipal-oriented specification. Municipal-oriented specifications are developed to reflect the administration, testing, and payment policies, procedures, and practices of many municipalities in Ontario.

Use of this specification or any other specification shall be according to the Contract Documents.

1302.01.02 Appendices Significance and Use

Appendices are not for use in provincial contracts as they are developed for municipal use, and then, only when invoked by the Owner.

Appendices are developed for the Owner's use only.

Inclusion of an appendix as part of the Contract Documents is solely at the discretion of the Owner. Appendices are not a mandatory part of this specification and only become part of the Contract Documents as the Owner invokes them.

Invoking a particular appendix does not obligate an Owner to use all available appendices. Only invoked appendices form part of the Contract Documents.

The decision to use any appendix is determined by an Owner after considering their contract requirements and their administrative, payment, and testing procedures, policies, and practices. Depending on these considerations, an Owner may not wish to invoke some or any of the available appendices.

1302.02 REFERENCES

When the Contract Documents indicate that municipal-oriented specifications are to be used and there is a municipal-oriented specification of the same number as those listed below, references within this specification to an OPSS shall be deemed to mean OPSS.MUNI, unless use of a provincial-oriented specification is specified in the Contract Documents. When there is not a corresponding municipal-oriented specification, the references below shall be considered to be the OPSS listed, unless use of a provincial-oriented specification is specified in the Contract Documents.

This specification refers to the following standards, specifications, or publications:

Provincial Statutes

Safe Drinking Water Act, 2002 S.O. 2002, c. 32

Canadian Standards Association Standards

A23.1-19/A23.2-19	Concrete materials and methods of concrete construction/Test methods and standard practices for concrete
A3000-18	Cementitious Materials Compendium

ASTM International

D 512-12	Chloride Ion in Water
D 516-16	Sulfate Ion in Water
D 4192-15	Potassium in Water by Atomic Absorption Spectrophotometry

American Association of State and Highway Transportation Officials (AASHTO)

T 26-79 (2008)	Quality of Water to Be Used in Concrete
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1302.03 DEFINITIONS

For the purpose of this specification, the following definitions apply:

Potable Water as per the *Safe Drinking Water Act, 2002*

1302.04**SUBMISSION AND DESIGN REQUIREMENTS**

Potable water is acceptable without testing. Water deemed not potable may be used in the manufacture of concrete without testing provided that a satisfactory history of strength and durability of concrete made with the water has been demonstrated.

Prior to its use in the work, a certificate from an independent test laboratory shall be submitted, to the Contract Administrator, stating the water is according to this specification.

1302.05**MATERIALS**

The water shall be according to CSA A23.1, water of unknown quality Table 1 shall apply.

The water shall not change the initial setting time of the test concrete by more than one hour when compared to a reference concrete prepared with potable water.

Water shall be clean and free from injurious amounts of oil, acid, alkali, organic matter or other deleterious substances.

The testing shall be performed by a laboratory certified by the Canadian Council of Independent Laboratories or CCIL.

1302.08**QUALITY ASSURANCE****1302.08.01****Sampling and Testing**

Except for potable water which may be used without testing, the water will be tested according to CSA A23.1 and CSA A3000 Setting Time by Vicat Method.

1302.08.02**Acceptance or Rejection**

Any indication of unsoundness, marked change in time-of-setting, or a reduction of more than ten percent in strength from test results obtained with mixtures containing water of satisfactory quality shall be sufficient cause for rejection of the water under test.

TABLE 1
Limits in Water used for making concrete

Parameter	Maximum concentration in mixing water (mg/L)	Test Method
Chlorides	500 (for prestressed concrete)* 1,000 (for other reinforced concrete)*	ASTM D512
Sulphates (as SO ₄)	3,000	ASTM D516
Alkalis (Na ₂ O + 0.658 K ₂ O)	600**	ASTM D4192
Total solids	50,000	AASHTO T 26

*The contribution of the mixing water to the total chloride in the concrete shall not exceed the limits specified in Clause 4.1.1.2 of CSA A23.1.

**The contribution of the mixing water to the total alkali in the concrete shall follow the guidelines in CSA A23.2-27A.

**Appendix 1302-A, November 2019
FOR USE WHILE DESIGNING MUNICIPAL CONTRACTS**

Note: This is a non-mandatory Commentary Appendix intended to provide information to a designer, during the design stage of a contract, on the use of the OPS specification in a municipal contract. This appendix does not form part of the standard specification. Actions and considerations discussed in this appendix are for information purposes only and do not supersede an Owner's design decisions and methodology.

Designer Action/Considerations

The designer should ensure that the General Conditions of Contract and the 100 Series General Specifications are included in the Contract Documents.

Related Ontario Provincial Standard Drawings

None