CAN/CSA A23.1-09 Concrete materials and methods of concrete construction

This document provides an overview of the requirements of CAN/CSA A23.1-09 Concrete materials and methods of concrete construction with respect to welding. It is designed to provide guidance for individuals and organizations involved in the design, fabrication of cast-in-place concrete and concrete precast in the field and residential concrete used in the construction of buildings conforming to Part 9 of the National Building Code of Canada (NBCC).

This document is only for general guidance purposes; reference to the full text of CSA A23.1 should be made. For further information, please contact the CWB at 1-800-844-6790 or info@cwbgroup.org.

Introduction

Welding is a key joining method used in the fabrication of reinforcing bars in concrete construction. To ensure welds of the highest quality and the safety of both the users of buildings and the general public, CSA Standard A23.1 provides specific requirements around the standard practices for concrete constructions and welded fabrication rebar structures.

Welded Fabrication

CSA A23.1 provides the following requirements:

6.6.10 Welding of reinforcement

6.6.10.1 Welding of reinforcement shall conform to the requirements of CSA W186. Weldable grade bars shall be used unless a fusion weld is employed.

6.6.10.2 Tack welding of reinforcing bars shall be performed in accordance with CSA W186.

6.7.4 Welding of hardware

6.7.4.1 Welding of steel hardware shall conform to the requirements of CSA W59.
Note: Welding procedures should be such that no damage to the concrete will result.

6.7.4.2 Welding of reinforcing bars to hardware shall conform to the requirements of CSA W186.

CSA Standard W186 provides requirements for the qualification of welders and welding operators, welding procedures and welding supervisory and engineering personnel. A company certified to CSA W186 Division 1 requires having full time engineer(s) and a company certified to Division 2 requires having retained part time engineer(s).

CSA Standard W59 provides guidance on weld design, fabrication techniques, inspection and other key considerations around welding for steel. CSA Standard W59 requires that contractors performing work under this standard be certified under the requirements of CSA Standard W47.1 unless the Engineer of record approves the contractor for the work to be undertaken.

An organization meeting the requirements of CSA Standard W47.1 and / or CSA Standard W186 will have qualified welders, operators, accepted welding procedures and accepted supervisory/engineering personnel. All elements of the welding operation will be independently verified by the Canadian Welding Bureau on an on-going basis.

Please note that there are no domestic or international equivalents to CSA Standard W47.1 or CSA Standard W186. Other national systems, such as that of the American Welding Society (AWS) do not include key concepts such as independent and on-going verification and welding supervisors/engineers. The CWB strongly cautions the reader around accepting substitutions; doing so may contravene the intent of CSA A23.1 and place public safety at risk.

For a listing of all organizations that currently meet the requirements of CSA Standard W47.1 and CSA Standard W186 please see *www.cwbgroup.org*.

Welding Inspection

CSA Standard W59 and CSA Standard W186 require that all welds be visually inspected. In addition, when required by contract weld inspection must be completed by certified welding inspectors or a welding inspection organization following the requirements of CSA Standard W178.2 or CSA Standard W178.1 respectively. It also requires that CSA Standard W59 and CSA Standard W186 be followed for the acceptance criteria for all welds. It should be noted that CSA Standard W178.2 has individual "product categories" that inspectors may qualify to, including one for CSA Standard W59.

For a listing of all organizations and individuals who currently meet the requirements of CSA Standard W178.1 and CSA Standard W178.2, please see *www.cwbgroup.org* .