CAN/CSA- CSA S157-17 Strength Design in Aluminum Welding Requirements

This document provides an overview of the requirements of *CAN/CSA- S157-17-Strength Design in Aluminum* with respect to welding. It is designed to provide guidance for individuals and organizations involved in the design of members to meet the requirements of the National Building Code of Canada using limit states design procedures.

This document is only for general guidance purposes; reference to the full text of CSA S157 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 aluminum structures. To ensure welds of the highest quality and the safety of both the users of buildings and the general public, CSA Standard S157 provides specific requirements around the design of aluminum structures and welded fabrication and erection of aluminum structures, with awareness that buildings are occupied by people.

Welded Fabrication

CSA S157 provides the following requirements:

18.8 Welding
18.8.1 *All welding shall meet the requirements of CSA W59.2.*

18.8.2 *Fabricators and erectors responsible for welding structures fabricated or erected under this Standard shall comply with the requirements of CSA W47.2 in Division 1 or Division 2. Part of the work may be sublet to a Division 3 fabricator or erector; however, the Division 1 or Division 2 fabricator or erector shall retain responsibility for the sublet work.*

18.8.3 *Stud welds shall meet the requirements of CSA W59.2, using the drawn arc or capacity discharge methods. At the option of the fabricator, fillet welds may be used for the welding of studs, with minimum weld sizes meeting the requirements of CSA W59.2.*

21.5.2 *Competence of inspectors*
The contractor's visual welding inspectors shall be:
(a) an individual(s) deemed competent by the contractor; or
(b) a certified welding inspector(s) certified in accordance with CSA W178.2.

Third party visual welding inspection and non-destructive examination shall be performed by the organizations certified to CSA W178.1, except that visual welding inspection may also be performed by individuals certified to Level 2 or 3 of CSA W178.2.

21.5.3 *Quality of welds*
The acceptance criteria for all welds shall be in accordance with CSA W59.2.

CSA Standard W47.2 provides requirements for the qualification of welders and welding operators, welding procedures and welding supervisory and engineering personnel. A company certified to CSA W47.2 Division 1 requires having full time engineer(s) and a company certified to Division 2 requires having retained part time engineer(s). A company certified to CSA W47.2 Division 3 does not require the company to have a welding engineer.

CSA Standard W59.2 provides guidance on weld design, fabrication techniques, inspection and other key considerations around welding for steel. CSA Standard W59.2 requires that contractors performing work under this standard be certified under the requirements of CSA Standard W47.2.

An organization meeting the requirements of CSA Standard W47.2 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 W47.2. 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 S157 and place public safety at risk.

For a listing of all organizations that currently meet the requirements of CSA Standard W47.2 please see *www.cwbgroup.org*.

Welding Inspection

CSA Standard W59.2 requires 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 W59.2 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 W59.2.

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* .