

Standard for Steel Building Systems

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CANADIAN

Sheet Steel Building

INSTITUTE

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The purpose of this Standard is to:

- 1. Update Steel Building Systems standards.*
- 2. Set minimum quality standards.*
- 3. Assist in the design, specification and use of Steel Building Systems.*

Preface

One of the precepts of the Members of the Canadian Sheet Steel Building Institute is the development of, and adherence to, product standards to promote safety and good practices.

This Standard is intended to assist Buyers, Manufacturers, Dealers and Erectors of Steel Building Systems by providing information which can be adopted by reference where desired.

The technical provisions contained herein are in accordance with sound engineering principles, augmented by experience. They include recommended minimum requirements for live loads, materials, design, fabrication and erection. Of necessity, much of the detailed information concerning the above are contained in the various publications to which this Standard makes reference.

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Reference Publications

This Standard Makes reference to the following:

American Society for Testing and Materials (ASTM)

A446 —Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Physical (Structural) Quality.

Canadian Sheet Steel Building Institute (CSSBI)

38.6 —Standard for Sheet Steel Cladding.

Canadian Standards Association (CSA)

S16 —Steel Structures for Buildings.*

S136 —Design of Light Gauge Steel Structural Members.**

W47.1—Certification of Companies for Fusion Welding of Steel Structures.

W55.2—Resistance Welding Practice.

W55.3—Resistance Welding Qualification Code for Fabricators of Structural Members used in Buildings.

W59.1—General Specification for Welding of Steel Structures (Metal Arc Welding).

National Research Council of Canada

NRC 11246—National Building Code of Canada.

Thickness Designation

In this Standard, minimum thickness of steel, where specified, is given in inches to 3 decimal places. Indirect designation of sheet thickness by gauge number has been discontinued. For those who may still be accustomed to relate thickness to gauge number, the correlation between the former Manufacturer's Standard Gauge Number for sheet thickness (core thickness for zinc coated sheet) and the thickness expressed in inches is as follows:

12 MSG = 0.105 in.;	14 MSG = 0.075 in.;	16 MSG = 0.060 in.;
18 MSG = 0.048 in.;	20 MSG = 0.036 in.;	22 MSG = 0.030 in.;
24 MSG = 0.024 in.;	26 MSG = 0.018 in.	

* Re-numbered as two Standards, S16.1 and S16.2 in new editions pending.

** Re-titled "Design of Cold-Formed Steel Structural Members" in new edition pending.

STANDARD
for
STEEL BUILDING SYSTEMS

1. SCOPE

- 1.1 This Standard covers the design, fabrication and erection of Steel Building Systems.
- 1.2 This Standard includes only the necessary technical provisions for Steel Building Systems and is not intended to cover other contractual matters.

2. GENERAL

- 2.1 This Standard shall apply in those cases where the provisions of building codes or the Buyer's stated requirements are not specific. In the event of any conflict between the provisions of this Standard and the building regulations, such regulations shall apply and this Standard shall only amplify.
- 2.2 Where reference is made to other publications, such reference shall be considered to apply to the latest edition or revision approved by the organization issuing that publication.
- 2.3 Unless otherwise specified, the Manufacturer shall furnish all required materials in accordance with this Standard.
- 2.4 Unless otherwise specified, the roof slope eave height, length and width of building and spacing of bays shall be to the Manufacturer's standards.

3. DEFINITIONS

- 3.1 Manufacturer means a company which fabricates a Steel Building System.
- 3.2 Buyer means the person, firm or organization contracting with the Seller for the supply of a Steel Building System.
- 3.3 Seller means the person, firm or organization who sells a Steel Building System, whether a Manufacturer, dealer or erector.

3.4 Steel Building System means a building system, featuring steel structural and cladding components in conjunction with applicable Appurtenances.

3.5 Structural Framing means the steel framework consisting of primary members (rigid frames, beams, girders, trusses, arches, rafters, columns), secondary members (purlins, joists, struts, bracing, tension rods, girts, eave struts, base angle or channel, headers, jambs, sills and other structural items) and all necessary hardware.

3.6 Cladding means the exposed exterior wall and roof skin consisting of steel sheets or panels and including fasteners and attachments, weather sealants, trim, flashing, fascia, and closures, as applicable.

3.7 Appurtenances means accessory items such as doors, windows, louvers, ventilators, fans, ceilings, insulation, sky and wall lights, partitions, interior liner, gutters and downspouts, as applicable.

4. DESCRIPTION OF TYPES OF STEEL BUILDING SYSTEMS

4.1 Rigid Frame This type of building utilizes clear span Structural Framing consisting of rafters (tapered or uniform depth) rigidly connected to columns (tapered or uniform depth) with either fixed or pinned base details. The rigid frames, spanning the width of the building, are spaced on predetermined bay lengths and support the secondary structural members and Cladding.

4.2 Beam and Column This type of building utilizes tapered or uniform depth beams or girders supported by columns and may be either a single or multi-span structure. The primary beams or girders, spanning the width of the building, are spaced on predetermined bay lengths and support the secondary structural members, and Cladding.

4.3 Truss Frame This type of building utilizes variable or uniform depth braced trusses supported by columns and may be either a single or multi-span structure. The primary trusses spanning the width of the building, are spaced on pre-determined bay lengths and support the secondary structural members, and Cladding.

4.4 Self-Framing This type of building utilizes the Cladding as load bearing roof and wall diaphragms in addition to its function as a weather barrier, and may be either a single or multi-span structure.

5. CHECKLIST OF ITEMS

5.1 A Steel Building System includes the following:

5.1.1 Structural Framing (excluding Self-Framing type) including all necessary hardware.

5.1.2 Cladding, including fasteners and attachments, weather sealants, flashing, trim, fascia and closures, as applicable.

5.1.3 Exterior doors, windows, louvers and ventilators, including framing, fittings and hardware, as applicable.

5.1.4 Valley gutters in the case of multi-span buildings.

5.2 Unless otherwise specified, a Steel Building System does not include:

5.2.1 Foundations and their design.

5.2.2 Anchor bolts, anchor bolt templates, and leveling plates.

5.2.3 Setting, or supervision of setting, of anchor bolts.

5.2.4 Grouting of any type in the recess around the base of the wall cladding.

5.2.5 Grouting under columns, door jambs and end wall columns.

5.2.6 Electrical installations and wiring.

5.2.7 Plumbing, heating, and air conditioning.

5.2.8 Field painting.

5.2.9 Interior finishing and carpentry work of any kind.

5.2.10 Masonry or masonry anchors.

5.2.11 Step flashing, and flashing to existing buildings.

5.2.12 Valley interior downspouts, and drains (either underfloor or overhead).

5.2.13 Cranes, including beams, rails and hoists.

5.2.14 Glazing for windows and other openings.

5.2.15 Miscellaneous items such as exhaust fans, eave gutters, downspouts and insulation.

5.2.16 Openings, flashing, and framing in roof and wall required by other trades and for accessories furnished by others.

5.2.17 Structural fire protection.

6. MATERIAL STANDARDS

6.1 Structural Framing

6.1.1 Members and components of the Structural Framing shall be fabricated of structural quality steel conforming to CSA or ASTM material standards.

6.1.2 Structural fasteners shall be of a type permitted by CSA Standards S16 or S136.

6.2 Cladding

6.2.1 Cladding materials shall be suitable for the anticipated environmental conditions.

6.2.2 Sheet steel used for Cladding shall be zinc coated, stainless or weathering steels as described in CSSBI Standard for Sheet Steel Cladding.

6.2.3 Zinc coated sheet steel used for Cladding shall conform to ASTM A446. Minimum steel core thickness shall be 0.018 inches and minimum zinc coating designation shall be G90.

6.2.4 Prefinished zinc coated sheet steel used for Cladding shall have the material coated in coil form with colours of proven durability for exterior exposure.

6.2.5 Fasteners for attaching Cladding to Structural Framing and for attaching flashing, trim, etc. shall be to the Manufacturer's standards. Carbon steel fasteners shall have a minimum coating thickness of 0.0003 inch of zinc or cadmium.

6.3 Appurtenances

6.3.1 Unless otherwise specified, all Appurtenances included with the Steel Building System shall be to the Manufacturer's standards.

7. DESIGN LOADS AND COMBINATIONS

7.1 Unless otherwise specified, the assumed values, dispositions and combinations of live loads, including wind loads and seismic loads shall be as prescribed by the National Building Code of Canada for the locality concerned.

7.2 Dead load shall include the weight of all permanent construction and specified stationary equipment.

7.3 Live load shall include loads due to use and occupancy, specified movable equipment, snow, rain, impact and any other specified live load.

7.4 Wind load shall be that due to wind blowing on the building from any horizontal direction.

7.5 Seismic load shall be the assumed lateral load acting on the building in any horizontal direction as the result of earthquake motion.

8. DESIGN

8.1 The following standards shall apply to design:

8.1.1 Structural steel members and parts
—CSA Standard S16.

8.1.2 Cold-formed steel structural members
—CSA Standard S136.

8.1.3 Sheet Steel Cladding
—CSSBI Std for Sheet Steel Cladding.

8.1.4 Structural welding (metal arc)
—CSA Standard W59.1

8.1.5 Resistance welding
—CSA Standard W55.2

8.2 Framed openings for windows, doors and other Appurtenances shall be designed to structurally replace the Cladding or framing members they displace.

8.3 Cladding components, including joints, flashing and attachments of Appurtenances shall be designed to be weathertight.

9. FABRICATION

9.1 Materials furnished shall be as specified for the Steel Building System.

9.2 Components of the Steel Building System shall be fabricated true to dimension so that in erection all parts will fit properly together.

9.3 The size and weight of components as packaged for shipment shall be such as to permit transportation by common carrier.

9.4 Manufacturers of welded structural components shall be fully approved by the Canadian Welding Bureau to the requirements of CSA Standard W47.1 and/or CSA Standard W55.3.

9.5 All Structural Framing members shall have one coat of factory applied primer or other corrosion resisting coating on suitably prepared surfaces. These coatings are intended for short term temporary protection only.

9.6 Dissimilar materials which are incompatible in contact shall be separated by means of suitable coatings, gaskets or other effective means.

10. MARKING AND IDENTIFICATION

10.1 Erection part numbers shall be shown clearly on all members or bundles of identical pieces.

10.2 Fasteners required for erection shall be packaged and identified by size and type.

10.3 A master shipping list containing a description of the material, including erection part numbers, shall accompany the shipment of material.

11. INSPECTION

- 11.1 All finished material shall be inspected by the Manufacturer prior to shipment.

12. ERECTION

- 12.1 Unloading instructions, storage of materials and erection procedures as outlined by the Manufacturer shall be followed as closely as possible.

13. DRAWINGS

- 13.1 Proposal drawings, when required, indicating the scope of work covered by the proposal, shall be considered as sufficient information for bidding purposes.
- 13.2 Upon award of contract, erection drawings, foundation loads and anchor bolt setting

plans shall be available from the Seller prior to shipment of materials.

14. CERTIFICATION

- 14.1 If requested by the Buyer, the Seller shall submit with the proposal and/or bid the certificate of a professional engineer registered in a province of Canada to the effect that the Steel Building System which is the subject of such proposal and/or bid is in accordance with the stated requirements of the Buyer, the building regulations and this Standard, so far as is applicable.
- 14.2 If requested by the Buyer, upon award of contract the Seller shall submit a structural analysis of the Steel Building System which is the subject of such contract. The analysis shall be signed and sealed by a professional engineer registered in a province of Canada.

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