CSA STANDARDS

Z783-12

Deconstruction of buildings and their related parts

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Preface

This is the first edition of CSA Z783, *Deconstruction of buildings and their related parts*.

This Standard has been developed to provide a consistent approach to deconstruction methodologies for those involved in the deconstruction of buildings, including but not limited to contractors, consultants, consumers, designers, building owners, regulators, and material supply and value chain organizations.

Issues addressed in this Standard include

(a) contractual obligations;
(b) deconstruction processes, procedures, and methods; and
(c) recording the source and destination of materials, components, products, and systems resulting from deconstruction.

Users should be aware that the authority having jurisdiction might have additional approval requirements for deconstruction procedures, including procedures related to approvals, safe operation, and material handling, that are outside the scope of this Standard. This Standard may be referenced by governments to increase recoverable material flows away from waste disposal sites such as landfills by regulating the processes and procedures for the deconstruction of buildings.

The objectives of this Standard are to

(a) provide minimum requirements for efficiently deconstructing buildings;
(b) highlight methods and processes for directing materials, components, products, and systems from deconstruction into useful and economically beneficial applications; and
(c) improve the capacity of the building industry to contribute to the sustainable use of natural resources, reduce greenhouse gases, and reduce products and materials entering waste disposal sites such as landfills.

Remarks on greenhouse gas reduction, deconstruction specifications, typical deconstruction procedures, the benefits of deconstruction, and deconstruction feasibility assessment are found in Annexes A to E.

CSA gratefully acknowledges the financial support provided for the development of this Standard by the Canadian Construction Association (CCA), Canadian Copper and Brass Development Association (CCBDA), Canadian Institute for Steel Construction (CISC), Canadian Precast/Prestressed Concrete Institute (CPCI), Canadian Sheet Steel Building Institute (CSSBI), Natural Resources Canada (NRCan), and Public Works and Government Services Canada (PWGSC).

This Standard was prepared by the Subcommitte on Deconstruction, under the jurisdiction of the Technical Committee on Sustainable Construction Practices and the Strategic Steering Committee on Building Products and Systems, and has been formally approved by the Technical Committee.

March 2012

Notes:

(1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*

(2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*

(3) *This publication was developed by consensus, which is defined by* CSA Policy governing standardization — Code of good practice for standardization *as "substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity". It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this publication.*

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(c) wording of the proposed change; and
(d) rationale for the change.

Z783-12
Deconstruction of buildings and their related parts

0 Introduction

0.1 Deconstruction

This Standard deals with the deconstruction of buildings. Construction of buildings has a wide spectrum of direct and indirect effects on human health, communities, and the environment. According to CCA 81, in Canada approximately 40% of annual national resource expenditures can be attributed to the construction industry. While the reuse of the building should be considered as the first option, it is recognized that recovery of materials can be accomplished through demolition. Deconstruction during the demolition phase facilitates the reuse of materials without further processing through recovery of materials, components, products, and systems at the end of a building's life or when it is undergoing renovations or alterations.

0.2 Reasons for deconstruction

Construction, renovation, and demolition waste accounts for up to 25% of municipal solid waste measured by weight.* Resource planning and management of waste contribute significantly to the nature and extent of the environmental impacts.

Great potential exists in the deconstruction of building components to contribute to sound stewardship and conservation of the environment. Direct and indirect environmental benefits can include

(a) reduced stress on waste disposal sites, e.g., landfills;
(b) reduced raw material use;
(c) energy conservation in the raw material acquisition, manufacturing, and transportation phases; and
(d) reduced greenhouse gas emissions (see Annex A).

A detailed description of potential benefits is provided in Annex D.

**Taken from Statistics Canada (2002).*

0.3 Sustainable use of building stock

The following options should be considered for future use of building stock:

(a) reuse of the building or space;
(b) reuse of materials, components, products, or systems on site;
(c) reuse of materials, components, products, or systems off site;
(d) recycling of materials, components, products, or systems on site (e.g., chip wood for landscaping);
(e) recycling of materials, components, products, or systems off site (e.g., recycled concrete as aggregates in new concrete or as road base material); and
(f) recovery of materials for waste to energy.

Emphasis is placed on reuse, recycling, and recovery to reduce waste, thus increasing material efficiency and reducing the extraction of natural resources.

Notes:

(1) *See Figure 1 for a chart illustrating the flow of resources, materials, and components used in the construction and deconstruction of buildings.*

(2) *Reuse of materials or components in many cases requires an assessment to determine suitability for future uses. See Clause 4.3.4 on suitability of materials and components for reuse.*

0.4 Markets for materials

There is a growing awareness that it is possible to recover, for sale, reuse, or recycling, significant quantities of materials, components, products, and systems from buildings at the end of life. These materials, components, products, and systems are often seen as waste generated in a demolition project. For many years, many industries have been implementing recovery processes. However, the options and markets for reuse and recycling are always evolving along with their respective processes and technologies. This Standard can provide assistance in increasing the economic value of end-of-life building components and materials.

0.5 Economic benefits

Provincial/territorial and municipal jurisdictions and industries have recognized that material recovery strategies and practices can result in a number of economic benefits that include, but are not limited to,

(a) reduced haulage and tipping fees at waste disposal sites, e.g., landfills;
(b) a reduction in new material costs from reuse; and
(c) the potential to create revenue from the sale of used equipment and materials.

0.6 Design for disassembly

To simplify the deconstruction process, it is possible to incorporate features during the design and construction phase. CSA Z782 is a voluntary guidance document that provides a framework for reducing building construction waste during the design phase.

Design for disassembly and adaptability (DfD/A) is an approach to sustainability that can reduce the environmental footprint of the building industry by

(a) reducing waste generation;
(b) improving building longevity; and
(c) reducing energy consumption by intelligent design.

The disassembly component of CSA Z782 seeks to address DfD/A by making it easier to take products and assemblies apart in order to reuse or recycle materials. The adaptability component of CSA Z782 focuses on enabling the building to continue to be used beyond its original intent by readily accommodating substantial change within an existing physical asset.

CSA Z782 includes a conceptual framework for DfD/A as well as specific principles. CSA Z782 reviews quantifiable metrics for each DfD/A principle that, after further development, can be assembled into a matrix or checklist to guide users in the direction of disassembly criteria design.

1 Scope

1.1

This Standard specifies minimum requirements for processes and procedures connected with the deconstruction of buildings. It is intended for use by contractors, consultants, designers, building owners, regulators, and material supply and value chain organizations involved in deconstruction of a building that is at the end of its life or when it is undergoing renovations or alterations.

1.2

This Standard applies to existing buildings where deconstruction is to be considered as a means to reconfigure, remove, or partially remove an existing building.

Note: *See Clause 4.2.1 for typical materials, components, products, and systems included in the scope of deconstruction projects.*

1.3

This Standard does not specifically address

(a) landscaping (e.g., trees and other plantings, soils, and surface toppings);
(b) civil structures and works not attached to the building (e.g., roads, surface parking lots, runways, bridges, docks, transmission towers, water towers, cranes, and gantries);