
STANDATA interpretation 23-BCI-001/23-FCI-001

Building/Fire

Use of shipping containers (sea-cans) for storage

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Purpose

This clarifies the application of shipping containers (sea cans) for storage of materials as an acceptable solution under Division B or as an alternative solution under Division A of the National Building Code – 2023 Alberta Edition (NBC(AE)).

In addition, this provides clarity on the requirements to identify the storage of dangerous goods within the shipping container to the local Authority Having Jurisdiction (AHJ) through the fire safety plan, as outlined in the National Fire Code – 2023 Alberta Edition (NFC(AE)).

Discussion

Intermodal shipping containers or “sea-cans” are used for the transport of goods from one place to another. These containers are designed to be packed with goods and lifted, stacked, handled, and moved by one mode of transportation or another. However, their availability, capacity, and strength make them desirable for many other uses. Location for use will subject them to several requirements applicable to the construction and fire safe operation of buildings.

A building as defined by the NBC(AE) means any structure used or intended for supporting or sheltering any use or occupancy, and includes an addition built to an existing structure and, where applicable, the land adjoining a structure. Because shipping containers do not meet the prescriptive requirements found in the NBC(AE), the municipality may request an engineering review and submission of plans certified by a registered engineering professional prior to issuing a building permit.

Issues of importance to recognize prior to construction approval include but are not limited to:

- use and occupancy
- structural inspection
- foundation design
- anchorage to the foundation
- mechanical systems and ventilation
- building envelope and exterior finish

Any storage of dangerous goods as defined and regulated by the NFC(AE) must be disclosed to the local AHJ, in accordance with Subsection 2.8.1 and subsequent referenced articles. Dangerous goods mean those products or substances that are regulated by TC SOR/2008-34, "Transportation of Dangerous Goods Regulations."

As with all development uses, the use of shipping containers as a building must conform with zoning and all other bylaws applicable in a municipality. While some municipalities may accept shipping containers as buildings, other municipalities may limit their use through zoning controls.

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When planning for or permitting the use of sea-cans for storage, consideration should be given to the following but not limited to:

1. Location of the building:
 - Urban or remote site
 - Construction site or commercial site
 - Residential or commercial site
 - Public or private site
2. Shipping container use:
 - Inert materials or hazardous materials
 - Public or private use/access
3. Compliance with zoning/land use bylaws:
 - Spatial separation from other structures
 - Spatial separation from other shipping containers (sea cans)
 - Limiting distance from property lines
4. The relevant Occupational Health and Safety legislation as it relates to:
 - Hazard assessments
 - Confined spaces
 - Working alone

In addition to the above, the AHJ must take into consideration items stored in the shipping container to determine adequate spacing between structures, shipping containers, or any other identified outdoor hazard. (i.e., wood pallets, compressed gas cylinders, utilities, dangerous goods, etc.). As well as applicable spacing distances identified in Part 3 and Part 4 of the NFC(AE).

Safety Codes Act

Safety Codes Act Interpretation

1(1) In this Act,

(v) “owner” includes a lessee, a person in charge, a person who has care and control and a person who holds out that the person has the powers and authority of ownership or who for the time being exercises the powers of authority of ownership:

(bb) “safety codes officer” means an individual designated as a safety codes officer under section 31:

Safety Codes Act Part 1 Responsibilities

Owners, care and control

5 The owner of any thing, process or activity to which this Act applies shall ensure that it meets the requirements of this Act, that the thing is maintained as required by the regulations and that when the process or activity is undertaken it is done in a safe manner.

Code References

NBC(AE) Division A, Article 1.4.1.2.

1.4.1.2. Defined Terms

Authority having jurisdiction means a safety codes officer in the building discipline exercising authority pursuant to designation of powers and terms of employment in accordance with the Safety Codes Act.

Building means any structure used or intended for supporting or sheltering any use or *occupancy*.
Authority having jurisdiction means a safety codes officer in the building discipline exercising authority pursuant to designation of powers and terms of employment in accordance with the Safety Codes Act.

Limiting distance means the distance from an *exposing building face* to a property line, the centre line of a *street*, lane or public thoroughfare, or to an imaginary line between 2 *buildings* or *fire compartments* on the same property, measured at right angles to the *exposing building face*.

NFC(AE) Division A, Article 1.4.1.2

1.4.1.2. Defined Terms

Authority having jurisdiction means a safety codes officer in the fire discipline exercising authority pursuant to designation of powers and terms of employment in accordance with the Safety Codes Act.

A-1.4.1.2.(1) Defined Terms.

Authority Having Jurisdiction

The defined term “authority having jurisdiction” refers to a safety codes officer as the appointed individual responsible for decision-making in a number of areas. In most cases, this individual will be a member of an accredited municipal fire department. In municipalities that use accredited agencies for their inspection and enforcement, the fire department may not be involved. It is important that accredited municipalities employing accredited agencies properly designate the person(s) acting as the authority having jurisdiction. In addition, municipalities using accredited agencies should ensure that the agency has a close working relationship with the fire department during the decision-making process.

Dangerous goods means products, materials or substances that are
 (a) regulated by TC SOR/2016-95, “Transportation of Dangerous Goods Regulations (TDGR)” (see Table 3.2.7.1. of Division B), or
 (b) classified as controlled products under HC SOR/2015-17, “Hazardous Products Regulations” (see Note A-Table 3.2.7.1. of Division B).
 (See Note A-1.4.1.2.(1).)

NFC(AE) Division B, Section 2.8. Emergency Planning

2.8.1. General

2.8.1.1. Application

- 1) Fire emergency procedures conforming to this Section shall be provided for
 - a) every building containing an assembly, care, treatment or detention occupancy,
 - b) every building containing a school, college or university, or a daycare facility,
 - c) every building containing a licensed beverage establishment or a licensed restaurant,
 - d) every building containing an assembly occupancy other than one of those described in Clauses (b) and (c) with an occupant load of more than 30,

- e) every building containing an area where treatment is provided in business and personal services occupancies,
- f) every building required by the NBC(AE) to have a fire alarm system,
- g) demolition and construction sites regulated under Section 5.6.,
- h) storage areas in buildings or parts of buildings described in Article 3.2.1.1.,
- i) outdoor areas where products described in Article 3.3.1.1. are stored,
- j) every building, part of a building, and open area described in Article 4.1.1.1., and
- k) every building, part of a building, and open area where processes and operations described in Article 5.1.1.1. take place.

2.8.2. Fire Safety Plan

2.8.2.1. Measures in a Fire Safety Plan

- 1) For *buildings*, parts of *buildings* and areas described in Article 2.8.1.1., a fire safety plan conforming to this Section shall be prepared in cooperation with the fire department and other applicable regulatory authorities.
- 2) The fire safety plan shall be reviewed at intervals not greater than 12 months to ensure that it takes account of changes in the use and other characteristics of the *building*.
- 3) The fire safety plan shall include, in addition to the information required in Articles 2.8.2.2. to 2.8.2.11., as applicable, information on
 - a) the emergency procedures to be carried out in case of fire, including
 - i) sounding the fire alarm (see Note A-2.8.2.1.(3)(a)(i)),
 - ii) notifying the fire department,
 - iii) instructing occupants on the procedures to be followed when the fire alarm sounds,
 - iv) evacuating occupants, including special provisions for persons requiring assistance (see Note A-2.8.2.1.(3)(a)(iv)), and
 - v) confining, controlling and extinguishing the fire,
 - b) the appointment and organization of designated *supervisory staff* to carry out fire safety duties,
 - c) the training of *supervisory staff* and other occupants on their responsibilities as regards fire safety,
 - d) the type, location and operation of the *building* fire emergency systems, including diagrams,
 - e) the holding of fire drills,
 - f) the measures for controlling fire hazards in and around the *building*, and
 - g) the inspection and maintenance of *building* facilities provided for the safety of occupants.
 (See Note A-2.8.2.1.(3).)

2.8.2.3. Indoor and Outdoor Storage of Dangerous Goods

- 1) Where *dangerous goods* are stored or handled, the fire safety plan shall include the names, addresses and telephone numbers of persons to be contacted in case of fire during non-operating hours.
- 2) Where the *dangerous goods* referred to in Sentence (1) consist of *dangerous goods* classified as radioactive materials, the fire safety plan shall also include
 - a) methods to control a fire emergency and to safely and efficiently recover radioactive materials and equipment containing radioactive materials,
 - b) the names, addresses and telephone numbers of primary and alternative sources of expert advice and assistance on radiation safety, and
 - c) the location of primary and alternative sources of radiation survey instruments.

2.8.2.4. Indoor Storage of Combustible Products and Dangerous Goods

- 1) The fire safety plan for *buildings* or parts of *buildings* used for the storage of products listed in Sentence 3.2.1.1.(1) shall include the information described in Sentences (2) and (3).
- 2) The fire safety plan shall identify
 - a) the product classifications for each part of the *building* where products of different classifications are stored,

- b) the method of storage, including aisle widths for *rack* storage,
 - c) the maximum permitted height of storage for the *building* or part of the *building*, if different,
 - d) the maximum permitted size of *individual storage areas*, and
 - e) in *sprinklered buildings*, the sprinkler system design criteria, inside and outside hose allowances, and results of the benchmark sprinkler system main drain and waterflow tests.
- 3) Where the products stored include Group A plastics, rubber products, Level 2 or 3 aerosols, or *dangerous goods*, the fire safety plan shall identify their location and the maximum quantity of each product being stored.

2.8.2.5. Outdoor Storage

- 1) The fire safety plan for outdoor areas used for the storage of products listed in Sentence 3.3.1.1.(1) shall identify
- a) the location and classification of the products being stored,
 - b) the method of storage, including the clear spaces required and the maximum permitted size of *individual storage areas*,
 - c) the location of fire alarm systems and firefighting equipment, and
 - d) the measures for controlling fire hazards in and around the outdoor storage area.

2.8.2.7. Spill Control

- 1) The fire safety plan for buildings, parts of buildings, and open areas described in Article 4.1.1.1. shall include a spill management plan that describes the measures to be taken to direct the overflow of spilled liquids and water used for firefighting away from
- a) buildings,
 - b) adjoining properties,
 - c) means of egress,
 - d) air intakes and openings that could allow vapour to enter the building,
 - e) fire alarm control panels,
 - f) fire department access routes,
 - g) valves controlling fire protection systems and the water supply for firefighting,
 - h) fire department pumper connections or wall hydrants,
 - i) isolation valves controlling processes, and
 - j) valves controlling the flow of flammable liquids or combustible liquids.

2.8.2.8. Hazardous Processes and Operations

- 1) The fire safety plan for areas where processes and operations described in Article 5.1.1.1. take place shall include
- a) the location and identification of storage and use areas for specific products, in conformance with Article 2.8.2.4.,
 - b) the names, addresses and telephone numbers of persons to be contacted in case of fire during non-operating hours, and
 - c) where dangerous goods classified as radioactive materials are used or handled, the information specified in Article 2.8.2.3.

2.8.2.9. Hot Works

- 1) The fire safety plan for areas where hot works are conducted shall include the safety measures described in Section 5.2.

2.8.2.11. Construction and Demolition Sites

- 1) Except as required in Sentence (2), prior to the commencement of construction, alteration or demolition operations, a fire safety plan shall be prepared for the site that includes

- a) the designation and organization of site personnel to carry out fire safety duties, including a fire watch service if applicable,
 - b) the emergency procedures to be followed in the event of a fire, including
 - i) initiating a fire warning,
 - ii) notifying the fire department,
 - iii) instructing site personnel on the procedures to be followed once the warning has been initiated, and
 - iv) confining, controlling and extinguishing the fire,
 - c) measures for controlling fire hazards in and around the building (see Note A-2.8.2.11.(1)(c)), and
 - d) a maintenance procedure for firefighting measures required in Section 5.6.
- 2) Where construction, alteration or demolition operations are carried out in an existing building that is required to have a fire safety plan conforming to this Section, the fire safety plan shall take into account the changes occurring to the building.

2.8.2.12. Retention of Fire Safety Plans

- 1) The fire safety plan shall be kept in the building for reference by the fire department, supervisory staff, the authority having jurisdiction, and other personnel.
- 2) The fire safety plan for a building within the scope of Subsection 3.2.6. of Division B of the NBC(AE) shall be kept at the central alarm and control facility.
- 3) The fire safety plan for a building or facility within the scope of Sections 3.1., 4.1., and 5.1. shall be kept at the principal entrance to the building or facility.

2.8.2.13. Distribution

- 1) A copy of the fire emergency procedures and other duties for supervisory staff, as laid down in the fire safety plan, shall be given to all supervisory staff.

2.8.2.14. Posting of Fire Emergency Procedures

- 1) At least one copy of the fire emergency procedures for a building or part of a building shall be prominently posted in each floor area.
- 2) At least one copy of the fire emergency procedures for an outdoor storage site shall be prominently posted at the outdoor storage site.
- 3) In every hotel and motel bedroom, the fire safety rules for occupants shall be posted showing the locations of exits and the paths of travel to exits.
- 4) Where a fire alarm system has been installed with no provisions to transmit a signal to the fire department, a sign shall be posted at each manually actuated signalling box requesting that the fire department be notified and including the telephone number of that department.

NFC(AE) Division B, Article 3.3.2.9.

3.3.2.9. Fire Safety Plan

- 1) A fire safety plan conforming to Section 2.8. shall be prepared.

NFC(AE) Division B, Sentence 4.1.1.1.(1)

4.1.1.1. Application

- 1) Except as provided in Sentences (2) and (3), this Part applies to the storage, handling, use and processing of
 - a) flammable liquids and combustible liquids in buildings, structures and open areas, and

- b) water-miscible liquid mixtures classified as flammable liquids or combustible liquids in conformance with Article 4.1.2.2. in buildings, structures and open areas, and
 c) dangerous goods classified as flammable gases at fuel-dispensing stations. (See Note A-4.1.1.1.(1).)

A-4.1.1.1.(1) The all-inclusive phrase “buildings, structures and open areas” includes, but is not limited to, tank farms, bulk plants, fuel-dispensing stations, industrial plants, refineries, process plants, distilleries, and to piers, wharves and airports that are not subject to overriding federal control.

Part 4 applies wherever flammable or combustible liquids are used or stored, except as specifically exempted in Sentences 4.1.1.1.(2) and (3). In addition, Section 4.6. applies to dangerous goods classified as flammable gases at fuel-dispensing stations.

Part 4 contains both general and occupancy-specific provisions. While general provisions apply to all occupancies or operations identified within the scope of Subsection 4.1.1., occupancy -specific provisions apply only to the specific occupancy or operation stated.

To determine the provisions that apply to a given situation, the first step is to confirm which Section or Subsection corresponds to the operation or occupancy: this will help identify the occupancy -specific provisions that apply. The next step is to ensure that all general requirements that apply to the operation or occupancy are also identified.

NFC(AE) Division B, Article 4.1.5.5.

4.1.5.5. Emergency Planning

- 1) Emergency planning measures conforming to Section 2.8. shall be provided for all buildings, parts of buildings and open areas. .

NFC(AE) Division B, Article 5.1.5.1.

5.1.5.1. Fire Safety Plan

- 1) A fire safety plan conforming to Section 2.8. shall be prepared.

CSA-A660 Certification of manufacturers of steel building systems

3 Definitions

Steel building system — an integrated assembly of manufactured steel primary structural components, secondary structural components of any material, and cladding of any material, specifically designed by the manufacturer to support and transfer loads and provide a complete or partial building shell.

Application

This interpretation applies to shipping containers (sea-cans) used for storage of material and intended access by authorized personnel.

Interpretation

This interpretation provides clarification when compliance with NBC(AE) and/or NFC(AE) is applicable for the use of shipping containers.

- Shipping containers are not considered “steel building systems” under the scope of CSA A660 “Certification of manufacturers of steel building systems” and consequently CSA A660 does not apply to shipping containers.

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2. CSA-A277 "Procedure for certification of prefabricated buildings modules and panels" is not applicable to shipping containers within the scope of this interpretation.
3. Shipping containers that are modified, contain dangerous goods/hazardous materials, or occupied must comply with the NBC(AE) and the NFC(AE).
4. Shipping containers used for storing TDG Class 1 material and not deemed for an occupied building to meet NFC(AE) compliance only. These containers are:
 - unmodified
 - a stand-alone structure that is not connected or immediately adjacent to other structures or shipping containers, and
 - not permanent utilities connected to the shipping container (temporary utilities are allowed if appropriate cross ventilation provided)
5. Shipping containers intended for authorized personnel only and used for temporary storage for the following purpose are not required to comply with the NBC(AE) if the containers:
 - are unmodified
 - contain inert material storage
 - intended for storage of items to be moved or storage for a short time. Short time/temporary use is at the discretion of the AHJ/Fire SCO, (i.e., portable on demand storage)
 - are used as construction site tool crib, for access by authorized personnel only (no repair, workspace) or
 - file storage
6. Shipping containers where building services (HVAC, electrical, plumbing, or gas installation) are installed are required to comply with the Permit Regulation pursuant to the *Safety Codes Act*.
7. Permit or approval for all categories of shipping containers are at the discretion of the AHJ.
8. Any change of use requires applicable permits and approvals from the AHJ in the building discipline.

This INTERPRETATION is applicable throughout the Province of Alberta.

Unless stated otherwise, all Code references in this STANDATA are to the National Building Code - 2023 Alberta Edition or National Fire Code – 2023 Alberta Edition

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