



## Introduction

Over thirty million International Organization for Standardization (ISO) intermodal shipping containers (“containers”) are in use around the world today. These containers were built to ISO standards and maintained to standards defined by the International Maritime Organization’s (IMO) “Convention for Safe Containers”.

New or used, containers are being repurposed at a pace where container repurposing is now a multi-billion-dollar global industry. Containers are regularly repurposed and converted into *International Residential Code* (IRC) and *International Building Code* (IBC) occupancy uses. As a “building material”, the applications are widely diverse as is the extent to which the container is used as a structural building element.

For industry participants, the primary advantages of using containers are: availability, safety and security (extremely hard to damage), strength and durability, mobility, and speed of construction or installation. Containers are also manufactured to be stackable.

Well-intentioned design professionals, builders and owners attracted by the idea of repurposing containers have greatly publicized their use. The positive aspects of container conversion and public awareness for recycling and being eco-friendly has generated considerable attention.

These drivers and factors have created a broad array of applications and different industry segments. These emerging segments are categorized as follows:

- Single-unit versus multi-unit
- Temporary versus permanent

Due to benefits such as environmental friendliness, availability, strength, and speed of construction, containers are now regularly being repurposed. State and local jurisdictions are now reacting to

the growing trend and are lagging in terms of the appropriate regulations to apply and how best to achieve a reasonable level of code compliance. A patchwork of regulations has emerged, creating potentially conflicting and duplicative requirements. (See the section on Current Regulatory Environment and Appendix 3 for future provisions in the 2021 IBC.)

Despite inconsistencies at the state or local level, many design professionals, builders and owners have been able to demonstrate that projects utilizing containers comply with the general intent of model codes and can be approved by the authority having jurisdiction (AHJ).

## Scope

As with all ICC Guidelines, this guideline is not intended to be a regulatory document but rather a nonmandatory document that provides useful information for the industry, design professionals and code officials regarding containers that are repurposed for use as buildings or structures or as part of buildings or structures.

Many code officials, when presented with a request to use containers in their jurisdictions, are challenged by the process of determining what is in the best interest of their community. Notwithstanding zoning issues that focus on the arrangement of compatible buildings and land uses, in the interest of the social and economic welfare of their community, they also may encounter a lack of clear and concise permitting requirements and appropriate standards that apply to containers.

This guideline is intended to provide information and recommendations to those involved in the use of containers as buildings or structures in achieving a reasonable level of safety, public health and general welfare for the occupants.





Container-based coffee/retail shop, courtesy of Radco, Inc, a Twining Company.

## Current Regulatory Environment

To understand the current regulatory environment for the repurposing of containers, it is important to recognize the relationship and role of the various entities at the national, state, and local level that influence how a project is regulated and approved. The Modular Building Institute (MBI) is a nonprofit trade organization that represents manufacturers, contractors and fleet owners of both relocatable buildings and permanent modular construction projects. MBI contacted state and local jurisdictions to highlight their regulatory oversight for projects that use containers. In addition, MBI, code officials and other interested parties are working together to develop requirements at a national level

intended to facilitate future container projects.

## National Level

Despite a patchwork of emerging regulations and the absence of clear and uniform guidance, containers used as buildings or structures continue to gain acceptance on the state and local level. Nationally, recognizing the need to develop clear and reasonable code language that will enable uniform application and enforcement of regulations for containers, efforts have been completed by ICC's Building Code Action Committee (BCAC) to develop requirements for the IBC intended to help both design professionals and code officials in evaluating and approving future projects using containers. The codes used throughout the country are



updated and published every three years by ICC.

The first BCAC-sponsored code change proposal on containers was submitted in early January 2018. The proposal was incorporated into the code hearing process by ICC as proposal G151-18. Committee Action Hearings (CAH) were convened in April 2018 to consider the numerous code change proposals, including G151-18, and vote on the proposals. During the hearings, the original text of proposal G151 was modified slightly by the IBC - General Code Committee during the CAH process.

Following the CAH, interested parties and stakeholders were afforded the opportunity to submit public comments on the CAH action on all of the code change proposals, including G151. The only public comment on G151 was submitted by the BCAC, suggesting editorial clarifications and minor changes. The proposal was discussed and voted on during Public Comment Hearings (PCH) in October 2018, which was followed by an online vote of the eligible voting members of ICC called the Online Governmental Consensus Vote (OGCV).

Based on the results of the OGCV coupled with the vote taken at the PCH, ICC members voted to approve G151 "As Modified by Public Comments 1 & 2". See Appendix 3 for the new text, which will be included in the 2021 IBC.

## State Level

In the United States, regulation of repurposed containers as elements in building construction is accomplished in the majority of states via a statewide modular building program or by the agency that regulates the construction and approval of residential and nonresidential buildings or structures (see Appendix 1). Some states allow the use of containers that are modified,

provided the containers have first been evaluated in accordance with ICC-ES Acceptance Criteria for Structural Building Materials from Shipping Containers (AC462), which is discussed further in this Guideline. Other states have an outright prohibition on their use or have certain exceptions or exemptions depending upon size and purpose. A few states do not allow the use of containers that are modified within their state.

In addition, states with programs or agencies that oversee the use of repurposed containers occasionally vary in their interpretation of when and how a container may be modified or used as a building or structure or as a part thereof.

The following are examples of state laws or regulations governing or exempting the use of containers under specific conditions:

- California regulates containers that are modular and fabricated off-site, either in-state or out-of-state, under their Factory-Built Housing Program or Commercial Modular Program through the Housing and Community Development Department. Where containers that are proposed to be used as modular school buildings, such projects are regulated through the Division of the State Architect.
- Georgia regulates all containers intended for use as residential, commercial or industrialized buildings, including construction site office buildings with or without storage. Furthermore, the state is considering language that would require a container to be manufactured not more than 48 months prior to use as a building or building component.
- Maryland state law exempts industrialized buildings that are 8 body feet or less in width and 40 body feet or less in length that are used for business purposes, mobile offices or storage and not open to



the general public. The requirements are included in their Industrialized Building Program administered by the Department of Housing and Community Development.

- Massachusetts only allows new US shipping containers under their modular program. The program does not allow the use of repurposed shipping containers.
- Ohio regulates containers modified off-site with concealed components through their Board of Building Standards' Industrialize Unit (IU) Program.
- Texas allows repurposed shipping containers complying with the ICC-ES AC462 under its Industrialized Housing Building Program.

## Local Level

Local jurisdictions vary in their regulatory approach to the use of containers. Many jurisdictions rely on their state's regulations or codes when addressing the use of containers. Others adopt model codes that are modified to fit the need of their community. Furthermore, locally adopted zoning ordinances may have design standards that impose restrictions on materials and appearance that limit the use of containers. Such ordinances tend to make the use of containers expensive or unfeasible.

The following are examples of local laws or regulations governing or exempting the use of containers under specific conditions:

- City of Anchorage, "Policy AG.19, Intermodal Shipping Containers," Anchorage Building Safety, Anchorage, Alaska. Effective November 21, 2016.
- City of Long Beach, "Cargo Containers Used as Storage in Industrial Zones" and "Cargo Containers Adapted as a Building Material,"

Building and Safety Bureau, Long Beach, California. Effective February 18, 2008 and November 27, 2012, respectively.

- City of Los Angeles, "Cargo Container Conversion to Building Modules," Department of Building and Safety, Los Angeles, California. Effective June 2017.
- City of Louisville, "Homeowner's Permit Tool Box – A Check Guide to Permitting Your Shipping Container Project in Louisville Metro," Louisville Metro Government Center, Construction Review, Louisville, Kentucky. No effective date.
- City of Portland, "Code Guide, Special Construction – IBC/3/#1 & IRC/1/#2," Bureau of Development Services, Portland, Oregon. Effective January 29, 2013.
- City of San Diego, "Cargo Containers Information Bulletin 149," Development Services, San Diego, California. Effective October 2015.
- City of Tioga, "Ordinance No. 295," Grayson County, Texas. Effective 2011.
- County of Grayson, "Ordinance No. 295," City of Tioga, Grayson County, Texas. Effective 2011.
- County of Yakima, "Cargo Containers, Shipping Containers, Trailers, Storage Units, Ordinance Chapter 19.18," Yakima County Public Services, Building & Fire Safety Division, Yakima, Washington. Revised March 30, 2017.

## Industry Segments

There are multiple uses and applications for containers, each with its own need for segmentation and discussion. For example, there are obvious distinctions between a container used as a temporary, single-unit ground level office and a series of containers used as