



BBS MEMO

Ohio Board of Building Standards

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THE OHIO BUILDING CODES, BUILDING MATERIALS, AND SHIPPING CONTAINERS

The Ohio Board of Building Standards Industrialized Unit (IU) group frequently receives inquiries about the use of shipping containers as buildings or building components. A shipping container itself is of open construction (all components are visible in the finished product) and as such it is not within the scope of the IU program. However, if the container is modified off site, is of closed construction (assemblies with concealed components), and transported to the site of use, it falls within the scope of the IU program. Whether or not a shipping container is regulated as an IU, if it is modified with interior and exterior finishes, doors, windows, plumbing, or electrical fixtures, compliance with either the Ohio Building Code (OBC) or Residential Code of Ohio (RCO) is required depending on how it will be used.

Therefore, information is required to be provided on construction documents that indicates that the materials used in its construction comply with the applicable OBC referenced standards for metal materials used in a steel framed structure. As with any steel building component, designers must show evidence that a steel building or steel building components will be designed and fabricated according to the referenced standards listed in OBC Chapter 22 for steel building materials. This system of standards compliance is the same used to determine compliance for all Ohio-based IU steel building manufacturers. Consequently, designers cannot overlook this when owners are considering using steel shipping containers from unapproved or unknown sources as building components. Compliance can be accomplished one of three ways:

1. Documentation submitted showing compliance with the appropriate material standards;
2. Alternative engineered design submittals and technical data per OBC Section 106.5; or
3. Designed with strict adherence to the "Conditions of Use" of evaluation reports per OBC Section 114.3.2, by a listed conformity assessment body. (Currently, the Board is aware of the following evaluation reports for shipping containers from ICC-ES which are limited to intact non-retrofitted containers:
 - a. ESR-3764 for SG Blocks, Inc.
 - b. ESR-4082 for Sea Box Inc.
 - c. ESR-4163 for Falcon Structures.)

It appears then that, for most shipping containers manufactured outside the U.S. with no evaluation report, the only way to accept them as structural building materials is to have metal samples from each component type within each container tested and have the welds evaluated by an Ohio recognized conformity assessment body or, when used as an alternative engineered design, have each retrofitted steel container subjected to OBC Chapter 17 testing procedures (refer to OBC Sections 1713 – 1715).

Finally, when reviewing shipping containers for compliance with the codes, particular attention should be given to the following:

1. The wood floor decks in shipping containers are treated with highly toxic insecticides and are difficult to remove without damaging the base structural materials; and
2. Metal quality and strength has a great range of values – approximately 20,000 to 70,000 kips/sq. in. The designer wishing to use shipping containers must provide data documenting what the materials used are in order to determine that they will be used in compliance with the codes.

Objective identification of materials that are manufactured, tested, and listed in compliance with consensus standards protects the building owner regarding material suitability, sustainability, and consistency of construction as well as provides a level competitive playing field for all current listed and compliant material providers. This material identification system used in Ohio and the U.S. ultimately reduces the costs of materials, provides uniformity, and assures safety in the built environment.

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