

ACCEPTANCE CRITERIA FOR STRUCTURAL BUILDING MATERIALS FROM INTERMODAL SHIPPING CONTAINERS

AC462

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PREFACE

Evaluation reports issued by ICC Evaluation Service, LLC (ICC-ES), are based upon performance features of the International family of codes. (Some reports may also reference older code families such as the BOCA National Codes, the Standard Codes, and the Uniform Codes.) Section 104.11 of the *International Building Code*® reads as follows:

The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

This acceptance criteria has been issued to provide interested parties with guidelines for demonstrating compliance with performance features of the codes referenced in the criteria. The criteria was developed through a transparent process involving public hearings of the ICC-ES Evaluation Committee, and/or on-line postings where public comment was solicited.

New acceptance criteria will only have an “approved” date, which is the date the document was approved by the Evaluation Committee. When existing acceptance criteria are revised, the Evaluation Committee will decide whether the revised document should carry only an “approved” date, or an “approved” date combined with a “compliance” date. The compliance date is the date by which relevant evaluation reports must comply with the requirements of the criteria. See the ICC-ES web site for more information on compliance dates.

If this criteria is a revised edition, a solid vertical line (|) in the margin within the criteria indicates a change from the previous edition. A deletion indicator (→) is provided in the margin where any significant wording has been deleted.

ICC-ES may consider alternate criteria for report approval, provided the report applicant submits data demonstrating that the alternate criteria are at least equivalent to the criteria set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. ICC-ES retains the right to refuse to issue or renew any evaluation report, if the applicable product, material, or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or if malfunctioning is apt to cause injury or unreasonable damage.

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ACCEPTANCE CRITERIA FOR STRUCTURAL BUILDING MATERIALS FROM INTERMODAL SHIPPING CONTAINERS (AC462)

1.0 INTRODUCTION

1.1 Purpose: The purpose of this acceptance criteria is to establish requirements for structural building materials sourced from intermodal shipping containers to be recognized in an ICC Evaluation Service, LLC (ICC-ES), evaluation report under the 2021, 2018 and 2015 *International Building Code*[®] (IBC) and the 2021, 2018 and 2015 *International Residential Code*[®] (IRC). The bases of recognition are IBC Section 104.11 and IRC Section R104.11.

1.2 Scope: The acceptance criteria is limited to the evaluation of the reuse of intermodal shipping containers as a source of building materials, with the steel components of the intermodal shipping containers redesigned for use in the design of steel structures under Section 3114 of the 2021 IBC (Sections 104.9, 2204, 2205, 2210, and 2211 of the 2018 and 2015 IBC) and Sections R104.9 and R301.1.3 of the IRC. The intent of the acceptance criteria is to evaluate the quality control procedures used to establish and verify the dimensions, chemical and physical properties of the steel components of the intermodal shipping containers, and to evaluate the steel components for design in accordance with the provisions of the IBC.

1.3 Codes and Referenced Standards:

1.3.1 2021, 2018 and 2015 *International Building Code*[®] (IBC), International Code Council.

1.3.2 2021, 2018 and 2015 *International Residential Code*[®] (IRC), International Code Council.

1.3.3 International Convention for Safe Containers, 1972, International Maritime Organization (IMO).

1.3.4 Rules for Certification of Cargo Containers, dated 1998, American Bureau of Shipping (ABS).

For evaluation under the 2021 IBC, the additional referenced standards are also applicable:

1.3.5 ISO 668:2013, Series 1 Freight Containers – Classifications, Dimensions and Ratings, International Organization for Standardization.

1.3.6 ISO 1496-1:2013, Series 1 Freight Containers – Specification and Testing – Part 1: General Cargo Containers for General Purposes, International Organization for Standardization.

1.3.7 ISO 6346:1995 with Amendment 3: 2012, Freight Containers – Coding, Identification and Marking, International Organization for Standardization.

2.0 BASIC INFORMATION

2.1 General: The following information shall be submitted:

2.1.1 Product Description: Description of the components of the intermodal shipping container to be used, including detail drawings of the components.

2.1.2 Packaging and Identification: A description of the method of field identification of the structural building materials, sourced from the intermodal shipping containers, and delivered to the jobsite for final installation. Product identification shall be in accordance with the product identification provisions of the ICC-ES Rules of Procedure for Evaluation Reports.

3.0 REQUIRED DATA

3.1 Intermodal Shipping Container Manufacturer: All intermodal shipping container manufacturers, from which intermodal shipping containers are to be accepted as a source of the building materials shall be identified.

3.2 Intermodal Shipping Container Certification: The intermodal shipping containers shall have been initially certified for compliance to the Rules for Certification of Cargo Containers and the International Convention for Safe Containers (CSC) for use as intermodal shipping containers by the American Bureau of Shipping (ABS), Bureau Veritas, or Lloyd's Register. A current copy of the certification, in English, shall be submitted. For evaluation under the 2021 IBC, intermodal shipping container information shall comply with Section 3114.3 of the 2021 IBC, unless material properties are established by testing in accordance with 2021 IBC Section 3114.8.4.1. Intermodal shipping container data plates shall comply with ISO 6346.

3.3 Intermodal Shipping Container Specifications: Copies of the intermodal shipping container specifications and detail drawings for each intermodal shipping container manufacturer shall be submitted in English. For evaluation to the 2021 IBC, intermodal shipping container types shall comply with ISO 668.

3.4 Material Cross-Reference: Portions/items of the intermodal shipping container to be used as structural building materials shall be identified. A cross-reference between the intermodal shipping container components, material specification applicable to each component, and the equivalent IBC reference standard shall be submitted. A material properties comparison of standards not referenced directly by the IBC or not referenced by IBC referenced documents shall be prepared by registered design professional and submitted by the applicant. As an option to the above, structural material properties may be established in accordance with 2021 IBC Section 3114.8.4.1.

3.5 Quality Control Program: Used intermodal shipping containers shall have been inspected and accepted for seaworthiness in accordance with the International Convention for Safe Containers (CSC) after removal from service as a intermodal shipping container and prior to use as a source of building materials. The quality control program shall require a copy of the current inspection to be submitted for each intermodal shipping container. The quality control program for accepting intermodal shipping containers shall be submitted.

3.6 Qualification Test Plan: A qualification test plan shall be submitted to and approved by ICC-ES prior to any testing being conducted.

4.0 TEST AND PERFORMANCE REQUIREMENTS

4.1 If structural capacities are to be included as part of the evaluation, then compliance shall be shown with 2021 IBC Section 3114.8. If testing is needed to establish structural capacities, then a qualification testing plan shall be submitted for review and approval by ICC-ES staff.

4.2 Single-unit, stand-alone intermodal shipping container corrugated siding shear walls for wind or seismic loading shall comply with Table 3114.8.5.3 of the 2021 IBC.

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| **5.0 QUALITY CONTROL**

| **5.1** Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted. The submitted quality documentation shall include the information required under Sections 2.1.1, 2.1.2, and 3.1 through 3.5 of this acceptance criteria.

| **5.2** The structural building materials shall be sourced from intermodal shipping containers under an approved quality control program with inspections by ICC-ES or by a properly accredited inspection agency that has a contractual relationship with ICC-ES.

| **5.3** A qualifying inspection shall be conducted at each manufacturing facility sourcing the structural building materials from intermodal shipping containers in accordance with the requirements of the ICC-ES Acceptance Criteria for Inspections and Inspection Agencies (AC304).

| **6.0 EVALUATION REPORT RECOGNITION**

| **6.1** The evaluation report shall provide a statement indicating the scope of the report is limited to the evaluation of the steel used in the construction of the intermodal

shipping containers for use in design in accordance with the applicable steel design standard.

| **6.2** For evaluation under the 2021 IBC, the evaluation report shall include the following statements:

| **6.2.1** Where approved by the code official, the markings and existing data plates on the intermodal shipping container are permitted to be removed before they are repurposed for use as buildings or structures or part of buildings or structures in accordance with Section 3114.4 of the 2021 IBC.

| **6.2.2** The design of buildings or structures with repurposed intermodal shipping containers conforming to ISO 1496-1 shall be in accordance with Section 3114.8 of the 2021 IBC.

| **6.3** The evaluation report shall require the submittal of plans and calculations to the authority having jurisdiction for the final structure being constructed from the materials from intermodal shipping containers. ■