

CHAPTER 3

DESIGN

SECTION 301 GENERAL

301.1 Application. Design of off-site construction shall be in accordance with the provisions of the applicable codes and standards adopted by the authority having jurisdiction. The requirements in this standard shall be in addition to the requirements of the applicable codes and standards.

301.2 Alternative materials, design and methods of construction and equipment. The provisions of this standard are not intended to prevent the use of alternate materials and methods permitted by IBC Section 104.11.

301.3 Transportation. Transportation considerations shall be in accordance with Chapter 7.

301.4 Use of shipping containers repurposed as buildings and building components. A structure incorporating shipping containers shall be designed and constructed to comply with IBC Chapter 16 and ICC Guideline G5, *Guideline for the Safe Use of ISO Intermodal Shipping Containers Repurposed as Buildings and Building Components*.

SECTION 302 FIRE AND SMOKE PROTECTION FEATURES

302.1 Scope. The provisions of this chapter shall govern the materials, systems and assemblies used for structural fire resistance and fire-resistance-rated construction separation of adjacent spaces to safeguard against the spread of fire and smoke within a building and the spread of fire to or from buildings for off-site construction.

302.2 Application. Design and installation of fire and smoke protection features shall be in accordance with the provisions of the applicable codes and standards adopted by the authority having jurisdiction. The requirements in this section shall be in addition to the requirements of the applicable codes and standards.

302.3 Construction documents. Construction documents shall be submitted to the authority having jurisdiction and shall include:

1. All building elements classified as primary structural frame or secondary members.
2. Whether primary structural frame elements require individual encasement protection or are permitted to have membrane protection.
3. Details demonstrating that columns, where provided, are protected on all sides for the full column height, including connections to other structural members. Where the column extends through a ceiling, the encasement protection shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.

4. Details that fire walls, where provided, have been designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions, or have been designed and constructed in accordance with NFPA 221.
5. Drawing details demonstrating that fire barriers, where required, extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed space, such as the space above a suspended ceiling.
6. Drawing details demonstrating that smoke barriers, where required, extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such smoke barriers shall be continuous through concealed space, such as the space above a suspended ceiling.
7. How continuity of horizontal assemblies are provided, where required by applicable codes and standards.
8. How vertical continuity of shaft enclosures and other vertical openings are being provided, where required by applicable codes and standards.
9. A schedule or drawings of fire-resistant joint systems, where required by applicable codes and standards.
10. How fireblocking is provided, where required by applicable codes and standards.
11. How draftstopping is provided, where required by applicable codes and standards.
12. Delineation of off-site and on-site portions of structural fire resistance and fire-resistance-rated construction.

302.4 Inspections. Inspections shall be in accordance with applicable codes and standards, including ICC 1205.

302.4.1 Special inspections. Where special inspections are required for sprayed fire-resistant materials or mastic fire-resistant coatings and intumescent fire-resistant coatings, the method of inspection for off-site and on-site elements shall be described.

302.5 Secondary attachments to structural members. Where primary and secondary members require fire protection, secondary attachments to those structural members shall be protected with the same fire-resistive material and thickness as required for the structural member. The protection shall extend away from the structural member a distance of not less than 12 inches, or shall be applied to the entire length where the attachment is less than 12 inches long. Where an attachment is hollow and the ends are open, the fire-resistive

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material and thickness shall be applied to both the exterior and interior of the hollow attachment.

Exception: Secondary attachments that are protected by different materials or thicknesses to the structural member shall be approved by the authority having jurisdiction.

SECTION 303 MECHANICAL

303.1 Scope. The provisions of this section shall govern the design and installation of mechanical and fuel gas systems for off-site construction.

303.2 Application. Design and installation of mechanical and fuel gas systems shall be in accordance with the provisions of the mechanical and fuel gas codes and standards adopted by the authority having jurisdiction. The requirements in this section shall be in addition to the requirements of the applicable codes and standards.

303.3 Construction documents. The design documentation shall describe and delineate the portions of the systems that are to be constructed off-site from those that are to be constructed on-site and identify the registered design professional responsible for off-site and on-site elements.

SECTION 304 ELECTRICAL

304.1 Scope. The provisions of this section shall govern the design and installation of electrical systems for off-site construction.

304.2 Application. Design and installation of electrical systems shall be in accordance with the provisions of the electrical codes and standards adopted by the authority having jurisdiction. The requirements in this section shall be in addition to the requirements of the applicable codes and standards.

304.3 Construction documents. The design documentation shall describe and delineate the portions of the systems that are to be constructed off-site from those that are to be constructed on-site and identify the registered design professional responsible for off-site and on-site elements.

SECTION 305 PLUMBING

305.1 Scope. The provisions of this section shall govern the design and installation of plumbing systems for off-site construction.

305.2 Application. Design and installation of plumbing systems shall be in accordance with the provisions of the plumbing codes and standards adopted by the authority having jurisdiction. The requirements in this section shall be in addition to the requirements of the applicable codes and standards.

305.3 Construction documents. The design documentation shall describe and delineate the portions of the systems that are to be constructed off-site from those that are to be constructed on-site and identify the registered design professional responsible for off-site and on-site elements.

SECTION 306 FIRE PROTECTION AND LIFE SAFETY SYSTEMS

306.1 Scope. The provisions of this section shall govern the design, installation and operation of fire protection systems for off-site construction.

306.2 Application. Design and installation of fire protection systems shall be in accordance with the provisions of the fire protection codes and standards adopted by the authority having jurisdiction. The requirements in this section shall be in addition to the requirements of the applicable codes and standards.

306.3 Construction documents. The design documentation shall describe and delineate the portions of the systems that are to be constructed off-site from those that are to be constructed on-site and identify the registered design professional responsible for off-site and on-site elements.

SECTION 307 EXTERIOR WALLS

307.1 Scope. The provisions of this chapter shall govern the minimum requirements for exterior walls, exterior wall coverings, exterior wall openings, exterior windows and doors, and architectural trim.

307.2 Application. The requirements for exterior walls shall be in accordance with the provisions of the codes and standards adopted by the authority having jurisdiction. The requirements in this section shall be in addition to the requirements of the applicable codes and standards.

307.3 Exterior walls. Exterior walls shall comply with requirements for system continuity.

307.3.1 Fire resistance of systems. Walls shall be properly constructed or sealed to ensure continuity of fire-resistive construction.

307.3.2 Control layers. Where applicable, air, vapor and weather barrier systems shall be designed and installed to provide continuity of the barrier.

307.3.3 Continuity of exterior insulation. Exterior insulation systems shall be designed and installed to provide continuity of the insulation.

SECTION 308 STRUCTURAL DESIGN

308.1 Scope. The provisions of this chapter shall govern the minimum requirements for structural design.

308.2 Application. Structural design shall be in accordance with the provisions of the codes and standards adopted by the authority having jurisdiction. The requirements in this section shall be in addition to the requirements of the applicable codes and standards.

308.3 Special requirements for modules. Modules shall comply with the requirements of Section 402.

308.4 Tolerances for panelized system construction. Tolerances for the attachment of panelized systems to other systems and interfacing construction shall be as established by the manufacturer of the attachment device.