IN-LB Inch-Pound Units

An ACI Standard

Thermal Bridge Mitigation for Buildings Having Concrete and Masonry Walls and Masonry Veneer – Code Requirements and Commentary

Reported by Joint ACI-TMS Committee 122

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This code prescribes minimum design and construction requirements for mitigating thermal bridges in the building envelopes of new buildings and additions to existing buildings. It applies to buildings having concrete or masonry walls; masonry veneer, including veneer attached to frame walls; and balconies or components that extend through the building envelope. It also has criteria for metal thermal bridges in these buildings.

This code is applicable to commercial buildings to high-rise residential buildings that use either electricity or fossil fuel (regardless of the generation source). It can be used with applicable energy codes and standards.

Keywords: thermal bridge.

PREFACE

This code provides requirements for mitigation of thermal bridges for use with energy efficiency codes and standards that have been adopted by a jurisdiction, such as ASHRAE/IES 90.1, the IECC, or a state energy code. The code has three alternative paths: a prescriptive path, a building envelope trade-off methodology, and a whole building energy simulation trade-off methodology.

ACI CODE-122.1-21 became effective October 22, 2021, and was published November 2021.

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CODE

CHAPTER 1—GENERAL

1.1—Scope

1.1.1 This code provides minimum design and construction requirements for mitigating thermal bridges in the building envelopes of new buildings and additions to existing buildings consisting of concrete or masonry construction. This code shall be permitted to be used with applicable energy efficiency codes and standards adopted by the jurisdiction.

1.2—General

1.2.1 The provisions of the code apply to:

a) Portions of buildings having concrete or masonry walls that are part of the building envelope

b) Portions of buildings having a masonry veneer, including veneer attached to frame walls that are part of the building envelope

c) Portions of buildings having concrete balconies or concrete projections that penetrate through the building thermal envelope

1.2.2 The provisions of this code do not apply to:

a) Single-family houses and residential structures with three stories or fewer above grade

b) Buildings that do not use either electricity or fossil fuel.

1.2.3 The official version of this code is the English language version using inch-pound units published by the American Concrete Institute.

COMMENTARY

CHAPTER R1—GENERAL

R1.1—Scope

R1.1.1 This code applies to buildings having concrete or masonry walls that are part of the building envelope, masonry veneer including veneer attached to frame walls that are part of the building envelope, and balconies or components that extend through the building envelopes. It also has criteria for metal thermal bridges in these buildings.

This code applies minimum requirements for mitigating thermal bridges in concrete and masonry construction in buildings.

This code applies to commercial and mid- to high-rise residential buildings. It can be used with applicable energy codes and standards such as ASHRAE/IES 90.1 or the IECC.

The provisions of this code are not intended to place any limits on the amount of concrete or steel that can be used for structural connections.

For some buildings, such as those in Climate Zones 0 through 4, the code indicates no mitigation is required. For buildings in Climate Zone 5, limited mitigation requirements apply. The minimum provisions provided by this code are not intended to prevent designers from applying more stringent thermal bridge mitigation strategies if desired. The items include the following components:

a) Thermal bridges at the intersection of parapets and roof insulation (Climate Zones 6 through 8)

b) Concrete balconies and projections (Climate Zones 5 through 8)

c) Shelf angles that support masonry or masonry veneer (Climate Zones 6 through 8)

d) Concrete, masonry, or metal components that penetrate completely through insulation in the building envelope excluding beams or columns that are part of the building envelope (Climate Zones 5 through 8)