# CE81-19

**IECC®: C402.2, C402.2.8 (New)**

## *Proposed Change as Submitted*

**Proponents:** Eric Makela, New Buildings Institute, representing New Buildings Institute (ericM@newbuildings.org)

## 2018 International Energy Conservation Code

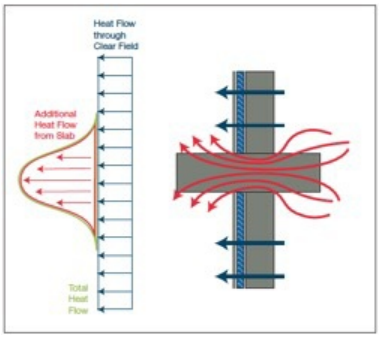
**Revise as follows:**

**C402.2 Specific building thermal envelope insulation requirements (Prescriptive).** Insulation in building thermal envelope opaque assemblies shall comply with Sections C402.2.1 through ~~C402.2.7~~ C402.2.8 and Table C402.1.3.

**Add new text as follows:**

**C402.2.8 Concrete slab floors.**
Concrete floor slabs that penetrate the building thermal envelope shall be provided with either continuous insulation having a minimum thermal resistance of R-3 or a minimum R-3 thermal break located where the concrete slab penetrates the building thermal envelope.

**Reason:** The requirements for overall assembly insulation have been well-addressed in the code. However, the existing requirements do not adequately address significant thermal bridging issues.
Thermal bridges are created when a relatively high thermally conductive material “bridges” through the insulating materials in the thermal envelope. Whether they penetrate all the way from the exterior to the interior of the building or only partially through the thermal envelope, thermal bridges make it easier for heat to travel in or out of the building. The impact of thermal bridges has a greater energy impact than a simple weighted U-factor calculation would suggest. Weighted U-factor calculations assume that heat travels in parallel paths through an assembly. In reality, heat also moves laterally, resulting in additional heat transmission through the assembly.




This has an impact on the heating and cooling loads of the building, as well as on the perceived comfort of space occupants. Humans perceive heat primarily through conduction, then radiation, then convection. So the presence of hot or cold surfaces due to thermal bridges can have a significant impact on thermal comfort. When the thermal envelope has hot or cold spots from thermal bridges, occupants are more likely to feel uncomfortable and respond by over-conditioning the air in the space, creating another source of energy loss.

The common practices of leaving concrete slab floor edges un-insulated and extending structural slabs through the thermal envelope to create balconies are particularly problematic and significant thermal bridges. This proposal addresses this significant issue by requiring that the thermal bridges created by concrete floor slabs that penetrate the building thermal envelope be addressed either by providing them with thermal breaks or by encapsulating them in continuous insulation. There are products available on the market that can be used to provide a thermal break within a continuously poured slab that extends to create a balcony. Alternately, balconies can utilize alternate structural configurations that do not require turning the building into a huge radiator.

**Cost Impact:** The code change proposal will increase the cost of construction
This will increase the cost of construction. Cost impact will vary depending on the approach taken.



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## *Public Hearing Results*

**Committee Action:** **Disapproved**

**Committee Reason:** Proponent requested disapproval to work with opponent and bring back a public comment (Vote: 15-0).

**Assembly Action:** **None**

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# ***Individual Consideration Agenda***

## *Public Comment MAKELA-2:*

**IECC®: C402.2.8 (New)**

**Proponents:** Eric Makela, representing New Buildings Institute (ericm@newbuildings.org) requests As Modified by Public Comment

**Modify as follows:**

## 2018 International Energy Conservation Code

**Revise as follows:**

**C402.2.8 Peripheral edges of intermediate ~~Concrete slab~~ floors and balconies.** ~~Concrete~~ Peripheral edges of intermediate floor s ~~slabs~~ and extensions of floors that penetrate the building thermal envelope , including balconies, shall be provided with either continuous insulation having a minimum thermal resistance of R-3 or a minimum R-3 thermal break located where the concrete slab penetrates the building thermal envelope.
Continuous applications of Fire safing shall be deemed to comply.
When compliance is in accordance with Section C402.1.5 on component performance alternative, the peripheral edges of intermediate floors and extensions of floors that penetrate the building envelope shall be considered above grade walls.

Exceptions:

1. Buildings located in Climate Zones 1 through 3.

2. Existing buildings or alterations to existing buildings.

3. Uninsulated walls.

**Commenter's Reason:** The requirements for overall assembly insulation have been well-addressed in the code. However, the existing requirements do not adequately address significant thermal bridging issues.
Thermal bridges are created when a relatively high thermally conductive material “bridges” through the insulating materials in the thermal envelope.
Disapproval was requested for CE81 during the IECC Code Development Hearings to modify and clarify the proposal to specifically address peripheral edges of intermediate floors and balconies, assemblies that are areas of significant thermal bridging.

This Public Comment provides some practical exceptions to bring this proposal in line with ASHRAE with the understanding that the R-3 insulation can be traded-off by using the component performance alternative if there are overriding structural issues that will make is difficult to comply with the R-3 requirement.

**Cost Impact:** The net effect of the public comment and code change proposal will increase the cost of construction
This will increase the cost of construction. Cost impact will vary depending on the approach taken. Note that the Component Performance Alternative can be used to trade-off the continuous insulation through increases in efficiencies in other parts of the building envelope that may result in lower construction costs.